

Editors: Eric Mukherjee, Ike Jose, Will Alston, Patrick Liao, Ankit Aggarwal, Chris Chiego

Writers: Jaimie Carlson, JinAh Kim, Sarita Jamil, Lam Tran, Paul Lee, Max Smiley, Claudia Epley, Jay Misuk, Faheem Pahlwan, Paul Kasinski, Samantha Claypoole, Aayush Rajasekaran, Rein Otsason, Ben Cushing

Tossups:

1. **Donsker developed an extension of this theorem applying it to diffusely scaled random walks. In certain cases, the divergence of this theorem from its predicted result is given by the Berry-Esseen theorem. An extension of this theorem states that multiplying a large enough number of variables will result in a log-normal distribution leading to (*) Benford's Law.** This theorem is often used to justify the applicability of a sample size of greater than 30, and its proof is similar to the proof of the law of large numbers. For 10 points, name this theorem which states that the sample mean of any independent random variable will be normal if the sample is large enough.

ANSWER: central limit theorem [or CLT]

2. **A Ute myth describes how the enraged hare-god Ta-wats attacked a god of this thing after that god, Ta-va, injured his shoulder, and the Mongolians believed that the marmot was created after another hero claimed he would cut off his thumbs and live in a hole if he failed in his assault against seven of these things. Another myth claims that these things were the children of Xi He and Di Jun, and were shot (*) down by the archer Hou Yi.** That was because nine of these things had come out simultaneously, not successively. In another myth, the goddess Uzume performed a comical strip tease which made the gods laugh so hard that the goddess of this object decided to emerge from the cave she had been hiding in because her brother Susanoo killed one of her attendants. For 10 points, name this domain of the goddess Amaterasu, whose brother Tsukuyomi was god of the moon.

ANSWER: the sun [or suns]

3. **The temperature equal to h-bar times gamma over 2 times Boltzmann's constant is the lower limit achievable using this effect. Saturated absorption spectroscopy is sometimes said to be "free" of this effect, which introduces a type of line (*) broadening counteracted by the Dicke effect.** An experiment in which canal rays were fired through perforated plates experimentally detected the transverse version of this effect; that experiment was conducted by Ives and Stilwell. This effect is used to measure the flow rate of blood through ultrasound, and in astronomy it is the basis for redshift. For 10 points, name this effect in which the frequency of a wave decreases as the source moves away.

ANSWER: Doppler effect [or Doppler cooling]

4. **The final section of this work returns to the tempo and form of its introduction in E-flat major before a set of rapid modulations ends in C minor for its reflective, somber finale. It transitions into its third section with the piano playing quiet staccato A major chords, and its second section may reference Turiddu's aria from Mascagni's opera *Cavalleria Rusticana*, (*) "Mamma, quel vino e generoso." The soloist in this song sings "Bismillah" in an appeal for God to protect his soul from Beelzebub, and rebukes the listener for thinking that they can "stone him" and "leave [him] to die," though he feels guilty for having "just killed a man." It ends in a slow, mournful fadeout in which the singer states that "nothing really matters." For 10 points, name this song which asks if this is "real life, or just fantasy," by Queen.**

ANSWER: "Bohemian Rhapsody"

5. **In one work by this author, a poet's father accuses him of "letting the strength of his arm go to waste," which he punningly confirms by putting the strength of his arm around his girlfriend's waist instead. This poet described the Sun's jealous killing of the lovers Midnight and the Morning Star in "The Barrier," and in another poem laments that "we have fall'n on evil days" and wishes for "the blast-defying power of thy form." "The clay is vile beneath our feet" in a poem which describes an object that (*) "grins and lies" and "shades our eyes," while in another work, a creature with "old, old scars" sends up "a prayer...from his heart's deep core." "Douglass" and "We Wear the Mask" are by this author whose poem "Sympathy" titles a memoir by Maya Angelou. For 10 points, name this poet, who wrote "I know why the caged bird sings."**

ANSWER: Paul Laurence Dunbar

6. In one cartoon titled “The Modern Balaam and his Ass,” a figure representing this event says, “Wherefore hast thou smitten thine Ass?” This event resulted in the bankruptcy of Arthur Tappan, which led him to establish the Mercantile Agency. One reaction to this event involved thousand of New Yorkers attacking merchants’ warehouses to obtain barrels of flour. The Kirtland Safety Society Bank failed during this event, which led Joseph (*) Smith to flee to Missouri. One attempt to address this event involved creating sub-treasuries; that failed act was the Divorce Bill. Other causes of this event included the dispersion of federal revenues in local “pet banks” through the Deposit and Distribution Act and the introduction of the Specie Circular. For 10 points, name this financial crisis that impacted the first year in office of President Martin Van Buren.

ANSWER: Panic of 1837

7. Some of the Fayum mummy portraits depict examples of these objects “of justification” that symbolized success in the afterlife. An elaborate ceremonial one of these objects called a *hemhem* is depicted on reliefs on Tutankhamun’s tomb. The *khepresh* was one of these objects used during war. On his namesake Palette, Pharaoh Narmer is depicted with two different examples of these objects on either side called the *deshret* and *hedjet*. Rulers of the 25th dynasty usually used one of these things with two attached (*) uraei. The *atef* was one of these objects that symbolized the power of Osiris. Two of these objects colored red and white, which symbolized authority over Lower and Upper Egypt, combined to symbolize the Pharaoh’s domain. For 10 points, name these ornate headpieces worn by pharaohs and other kings to symbolize authority.

ANSWER: crowns [accept wreaths since that can also apply to the first clue]

8. Neo-Dadaist Ushio Shinohara used this activity to create a series of “action paintings” in ink. Art historian Robert Haywood highlighted the similarity of the curve of the Belvedere torso to a painting of this activity executed within a triangular composition. A man with a cigar cynically glares back at the viewer in that painting where several red-faced men watch this activity, which is set across the street from the artist’s studio. The aftermath of one an instance of this activity is depicted in the (*) Thomas Eakins painting *Salutat*. A temporary status granted to socially disreputable participants in this activity is referenced in a painting by a student of Robert Henri that shows a black and white man engaging in this activity, titled *Both Members of this Club*. For 10 points, name this activity depicted in George Bellows’ *Stag at Sharkey’s*, which shows two men fighting in a ring.

ANSWER: boxing [prompt on fighting or equivalents]

9. This author contrasted two myths of filicide and patricide respectively, Ferdowsi’s “Rostam and Sohrab” and Sophocles’ *Oedipus Rex*, in a novella about a well-digger and his apprentice. Another of this author’s characters is described as “a bit of a weirdo, but he’s got a heart of gold,” and that character marries a girl whose love letters he actually wrote for her sister. Along with a novel about Mevlut’s futile attempts to strike it rich as a street vendor, this author of *The Red-Haired Woman* wrote about a self-absorbed man who founds the Lemon Films and falls in love with a girl that sells him a counterfeit (*) handbag; after his wife Sibel leaves him for his infidelity, this author’s character Kemal fills a museum with objects that remind him of his lover Fusun. For 10 points, name this Turkish author of *The Museum of Innocence* who wrote about the poet Ka in *Snow*.

ANSWER: Orhan Pamuk

10. In one film centered around one of these objects, a refugee uses one of these objects for a seven-day stunt to pay for his wife’s surgery, but becomes so fatigued that he cannot hear his son’s pleas for him to stop. The director of that film centering on one of these objects appears in a completely different film, where a young man dupes others into believing that he is Mohsen Makhmalbaf. Sabzian claims to have made a film about a man who uses one of these objects in Abbas Kiarostami’s *Close-Up*, and in another film, a woman (*) pawns her bedsheets so her husband can buy one of these back from the pawnbroker. That film ends with Bruno crying as he walks into the crowd with this father, upset that Antonio has become a thief of these things. For 10 points, name this mode of transportation stolen in a Vittorio De Sica film.

ANSWER: bicycles

11. The land that became this polity was gained through deals that were known as “cloth-and-trinket” treaties. This polity was the starting point of the Stairs Expedition, which eliminated the Yeke kingdom as a power by killing the brutal slave trader Msiri. It’s not the British Empire, but number of foreigners working in this polity journeyed *north* from it in a relief expedition to assist Emin Pasha, a governor appointed by

Chinese Gordon. Natives in this polity who objected to the (*) “Red Rubber” system were given punishments like hand-cutting by a group of *askaris*. Adam Hochschild’s most famous book examines actions carried out in this polity by groups like the Force Publique. Reports by Arthur Conan Doyle and Roger Casement highlighted brutal atrocities committed here. For 10 points, name this African colony owned by King Leopold II.

ANSWER: Congo Free State [prompt on Congo or Belgian Congo]

12. One school named for this term conceived of segmentary lineage as describing the kinship structures of warring factions. Evans-Pritchard’s monograph on the Nuer embodies this paradigm. In *Social Theory and Social Structure*, Robert K. Merton described the overt and subtle purposes for certain social acts by prefacing this term with “manifest” and “latent.” A sociologist in a school named for this term described (*) social consensus as taking two forms based on whether people have similar or different values, mechanical and organic solidarity. Unlike structuralists, anthropologists in a school named after this term eschew meaning and symbolism to focus on social structure. For 10 points, name this term used to denote the holistic purposes of individual institutions, one form of which is described as “structural” in a school of British social anthropology.

ANSWER: functionalism [accept word forms; accept structural functionalism, but do not accept or prompt on “structural” alone]

13. Negotiations between these two countries broke down after a politician told the other country’s diplomat to “bite granite.” The motto “we want eight and we won’t wait” was a motto used in one of these countries to counter the threat posed by the other country adopting Risk Theory. One of these countries secretly urged the other to join Italy and Austria in the Mediterranean Agreements to counterbalance (*) Russia, with which the first country had signed the Reinsurance Treaty. Eyre Crowe’s memorandum urged one of these countries to distrust the other’s attempt to earn “a place in the sun” through their “world policy”. They were the two biggest European economies and each other’s best trading partners at the outbreak of war in 1914. For 10 points, name these two great powers which had a naval arms race before the First World War, during which their navies fought at Jutland.

ANSWER: Germany and Great Britain [or Second German Empire and the United Kingdom of Great Britain and Ireland; or equivalents such as the Germans and the British, Second Reich and Perfidious Albion]

14. In a tea-shop, Flora Poste discusses the “demonic vitality” of a man with this surname, whose revisionist biography is being written by Mr. Mybug. One author with this surname created the Glass Town Verdopolis, inhabited by Warner Warner and the Duke of Zamorna. That author with this surname wrote a novel in which the protagonist sees a ghostly nun and debates with Paul Emanuel, who is killed in a tempest after attempting to convert her to Catholicism. In that novel, Dr. John Bretton marries Polly Home instead of (*) Lucy Snowe. Another author with this surname wrote a frame story in which Nelly Dean tells the renter Lockwood about Edgar Linton marrying Catherine Earnshaw, who is still loved by Heathcliff. For 10 points, name this surname shared by the author of *Villette* and *Wuthering Heights*, the sisters Emily and Charlotte.

ANSWER: Brontë

15. This work features a fountain that makes the princess of Cathay look like an ugly old woman, as well as one that causes its protagonist to lose his memory. One character in this work is indignant when he is arrested and held hostage by cooks. The protagonist of this work lives with his mother and a monk in a cave, but Bertha later has a joyful reunion with her brother, who had once been furious at Milon for running off with her. (*) Bramimonde is kidnapped in this work, and its villain is torn apart by horses after his friend Pinabel loses a duel to Thierry. The Saracen Marsile is defeated in this work after the title owner of the sword Durandal is betrayed by his stepfather Ganelon; that hero blows an oliphant so hard his temples burst, dying at the Battle of Roncevaux Pass. For 10 points, name this *chanson de geste* about the titular nephew of Charlemagne.

ANSWER: The Song of Roland [or *La Chanson de Roland*]

16. In one work, this thinker noted that different types of cars or the “respective merits of actresses” stimulate much more conversation than political topics, and that widespread communication was necessary for the formation of a Great Community. He opened another work by noting that unlike inanimate things, living things “maintain themselves through renewal,” and can adapt to further their own existence. In a refutation of *The* (*) *Phantom Public* by Walter Lippman, this thinker claimed that the public could cohere and play a significant role in politics, while in his best-known work, he argued the titular practice was necessary because

every society is composed of both adults and children, and that schools should be seen as part of civic life. For 10 points, name this American pragmatist author of *The Public and its Problems* and *Democracy and Education*.
ANSWER: John Dewey

17. **This variable affects transcription by setting the confirmation of the FourU and ROSE elements. In rats, neurons sensitive to this can be found in the PO/AH region. Lee Hartwell developed several *S. cerevisiae* mutants sensitive to this variable. In protein production in prokaryotes, lowering this variable during induction generally leads to increased yields. It's not electric current, but increasing this variable temporarily is a common way of chemically (*) transforming cells with plasmid. It's not pain, but information about this variable is carried by Lissauer's tract through unmyelinated C-fibers. In PCR primer design, the forward and reverse primers should have similar values for this variable "sub m." A sudden rise in this variable causes upregulation of the hsp protein family. For 10 points, name this variable, which in humans is elevated by pyrogens in fevers.**
ANSWER: heat or temperature

18. **Two John Adams works in this genre, as well as the piece *Absolute Jest*, were written for the Canadian ensemble St. Lawrence. A piece of this type composed on a trip to the Tucson desert uses only two pauses during four movements distinguished by "metric modulation." It's not a ballet, but John Cage wrote a four movement work of this type inspired by the four seasons in Indian philosophy. A piece in this genre serves as the third scene of an opera in the cycle *Licht* [liht] and calls for its players to perform in a (*) helicopter. Famous ensembles of this type include Guarneri and Kronos. Smetana's first piece of this type calls for a violin to sustain a high E to represent the ringing caused by onset of deafness, and is nicknamed "From My Life." For 10 points, name this type of chamber work for two violins, a viola, and a cello.**
ANSWER: string quartets [accept Helicopter String Quartet]

19. **It's not a wheel, but one of these objects with a thousand parts symbolizes the crown chakra in Vajrayana tradition. A text named for these objects states that the first instance of *parinirvana* was an illusion, since Shakyamuni still communicates with the world, and that his *nirvana* was an *upaya* to encourage followers to strengthen their practice. A millenarian sect named for these objects venerated the Unborn Venerable Mother, predicted the imminent coming of Maitreya and was banned by the Mongols. Components of the (*) Eightfold Path are symbolized by a white one of these objects viewed from above. The Tendai and Nichiren schools of Buddhism teach devotion to a Mahayana sutra named for these objects which teaches that all persons can attain Buddhahood. For 10 points, name this flower which the Buddha is often depicted sitting atop in the water.**
ANSWER: lotuses [accept White Lotus Society; prompt on flowers until read]

20. **A pentadehydro modification of this reaction can be used to generate alpha-three-dehydrotoluenes. Derivatives of one reagent commonly used as a reactant in this reaction include ones named for Brassard and Rawal. Tetrahydropyridines are generated from imines in the aza form of this reaction. This reaction is particularly fast between (*) cyclopentadiene and maleic anhydride, and this reaction preferentially generates the product generated when the electron-withdrawing groups on one reactant points inward, called the "endo" configuration. For 10 points, name this [4+2] cycloaddition in which a six-membered ring is created from a diene and a dienophile.**
ANSWER: Diels-Alder reaction

Bonuses:

1. Charles Rosen called the six-part Ricercar [REE-cher-car] from this work the "most significant piano work of the millennium." For 10 points each:

[10] Name this set of canons and fugues on a theme given to Johann Sebastian Bach on a visit to Potsdam. It contains ten canons, two Ricercars, and one trio sonata.

ANSWER: *The* Musical Offering [or *Das* Musikalische Opfer]

[10] The *Thema Regium* of the Musical Offering was given to Bach by this musical king of Prussia. A talented transverse flute player, this enlightened monarch wrote 121 sonatas and 4 concertos for the flute.

ANSWER: **Frederick II** [or **Frederick the Great**]

[10] *The Musical Offering*'s "Quaerendo invenietis" section is an example of this kind of arrangement of a musical canon, in which the following voice plays the inversion of the leading voice.

ANSWER: **Mirror** Canon [anti-prompt on **Table** Canon]

2. Rheometers can be used to measure this quality for varying flow conditions. For 10 points each:

[10] Name this quality, which measures a liquid's resistance to shear or tensile stress. Liquids with higher values for this quantity are usually considered more "sticky" and have lower Reynolds numbers.

ANSWER: **viscosity**

[10] In these types of fluids, viscosity is not a constant tensor but a time-dependent function changing with the stress applied. The cornstarch and water experiment creates this type of fluid.

ANSWER: **non-Newtonian** fluid

[10] In this kind of non-Newtonian fluid, the apparent viscosity increases the longer it experiences shear stress. Examples include printer ink.

ANSWER: **rheopectic**

3. This essay contrasts the differences in writing with a brush and a fountain pen and waxes eloquent about the sensation of holding a lacquer bowl. For 10 points each:

[10] Name this aesthetic essay, which contrasts modern Western ideology with the traditional concept of *sabi*.

ANSWER: **In Praise of Shadows** [or **In'ei Raisan**]

[10] In this novel by Junichiro Tanizaki, Kaname becomes fascinated by his father's "traditional" mistress Ohisa while divorcing his wife Misako.

ANSWER: **Some Prefer Nettles** [or **Tade kû mushi** or **Water-pepper-eating bugs eat it willingly**]

[10] Kaname is obsessed with these things, one of which turns into a woman at the end of the novel. In Arthur Miller's *The Crucible*, Elizabeth Proctor is accused of witchcraft for owning one of these things called a "poppet."

ANSWER: **dolls** [prompt on more general answers like **toys**]

4. Southern participants in this rebellion were led by Chen Youliang, who established a state he called Great Han. For 10 points each:

[10] Name this rebellion, which was led by the man who would become the Hongwu Emperor, Zhu Yuanzhang. It took its name from its participants' trademark headwear.

ANSWER: **Red Turban** Rebellion

[10] The rulers of the Yuan dynasty overthrown by the Red Turban rebellion were of this ethnicity. This group's unified empire divided into polities such as the Ilkhanate and the Golden Horde after the death of Mongke Khan.

ANSWER: **Mongols** [or the **Mongolian** empire]

[10] The instigator of the rebellion, Han Shantong, practiced this religion. The Fujianese temple of Cao'an [tsao-ah] was first built for this religion, which was widely practiced in Gaochang. It was the official religion of the Uighur Khanate for a time.

ANSWER: **Manichaeism** [or **Mandaeism**]

5. In this opera, one of the title characters ties the other's very long hair to a tree. For 10 points each:

[10] Name this opera, based on a Maurice Maeterlinck play, in which the two title lovers, who are in a love triangle with the jealous Golaud, meet at the Blind Man's Well.

ANSWER: **Pelleas et Melisande** [or **Pelleas and Melisande**]

[10] *Pelleas et Melisande* was written by this composer, who also created an opera based on *The Fall of the House of Usher*. He is better known as the composer of *Prelude to the Afternoon of a Faun* and *La Mer*.

ANSWER: Claude **Debussy**

[10] Debussy tried to avoid Wagnerian influence in *Pelleas et Melisande*, possibly because of his distaste for this other French composer's opera *Gwendoline*. This friend of Verlaine also composed the orchestral rhapsody *España*.

ANSWER: Emmanuel **Chabrier**

6. An urban legend claims that Ho Chi Minh invented Boston Cream Pie while working as a pastry chef for his man. For 10 points each:

[10] Name this famed French chef who invented the Peach Melba. His *Le Guide Culinaire* codified the five mother sauces of France.

ANSWER: Auguste Escoffier

[10] Three of the five mother sauces are based off of a roux, which is a combination of flour and this foodstuff. One of the foundations of French cuisine, it provides the fluffy, rich texture of the kouign amann and the croissant.

ANSWER: butter [or beurre]

[10] In *Mythologies*, Roland Barthes claims that this dish, like wine, is a myth conveying French-ness. Consuming it brings a “taurine strength,” and he claims that for intellectuals it is a “redemptive element ... by which they exorcise, through blood and soft pulp, the sterile dryness of which they are incessantly accused.”

ANSWER: steak frites [or bifteak et frites or steak and fries; prompt on incomplete answer]

7. This man successfully led guerilla campaigns in the defense of Drepana. For 10 points each:

[10] Name this Carthaginian general who lost the Battle of the Aegates Islands and was the father of Hannibal.

ANSWER: Hamilcar Barca [prompt on Barca]

[10] Hamilcar was given the task of quelling these kinds of rebels in a namesake conflict immediately following the First Punic War. The Carthaginians often employed Numidian cavalry and Iberians as these kinds of soldiers.

ANSWER: mercenaries [accept word forms; accept Mercenary War]

[10] This treaty negotiated by Carthage with its Roman namesake kicked Carthage out of Sicily at the conclusion of the First Punic War. Its harsh terms led to Carthage’s inability to pay the aforementioned mercenaries.

ANSWER: Peace of Lutatius

8. Identify the following literary references from *A Series of Unfortunate Events*, for 10 points each:

[10] In *The Ersatz Elevator*, the Baudelaires are taken in by a wealthy couple whose names allude to this J.D.

Salinger short story about a WWII sergeant who meets a bright but troubled British girl orphaned by the Blitz.

ANSWER: “For Esmé, with Love and Squalor” (with J.D. standing, of course, for Jerome David)

[10] In *The Penultimate Peril*, the last password to the Vernacularly Fastened Door protecting the sugar bowl is the “famous unfathomable question” in this novel by Richard Wright about the life of Bigger Thomas.

ANSWER: Native Son

[10] V.F.D. is revealed to stand for, for among other things, Volunteer Fire Department. This World War II veteran and millionaire has an obsessive admiration of volunteer firemen, and keeps a special red phone in his office just for people to report fires.

ANSWER: Eliot Rosewater [accept either underlined part]

9. Mycobacterium avium complex can cause serious conditions in poorly-treated patients infected with this virus.

For 10 points each:

[10] Name this virus that is commonly treated by AZT and other reverse-transcriptase inhibitors as part of HAART regimens. This retrovirus targets T cells and ultimately causes AIDS.

ANSWER: HIV [or Human Immunodeficiency Virus]

[10] This similar retrovirus likely served as an ancestor to HIV. It has been hypothesized that smm and cpz forms of these viruses jumped species and became HIV due to the human consumption of bushmeat.

ANSWER: SIV [or Simian Immunodeficiency Virus]

[10] This protein forms the capsid and the matrix of the newly formed HIV virus. p24 and gp120 components of this protein can be used in a western blot to help detect HIV.

ANSWER: gag

10. Saul changes his name to Paul in this book. For 10 points each:

[10] Name this fifth book of the New Testament named after the disciples of Jesus.

ANSWER: Acts of the Apostles

[10] Early Christian scholarship ascribed the authorship of Acts to this man whose gospel tells the “salvation history” of Jesus’ resurrection.

ANSWER: Luke the Evangelist

[10] This important figure from Sinope was central to the development of the New Testament as its own body of work was involved in a controversy and labeled a heretic for producing his own version of the Gospel of Luke.

ANSWER: Marcion

11. Socrates justifies this story by saying that it will strengthen unity within the state. For 10 points each:

[10] Name this story found in the *Republic* also called “the legend of the metals,” which claims that people are made of gold, silver, or iron, with the quality of the metal determining the relative superiority of the individual.

ANSWER: the noble lie [or gennaion pseudos]

[10] The social stratification of the ideal city in the *Republic* mirrors Plato’s tripartite division of this concept into the logical, spirited, and appetitive parts. Plato used the Myth of Er to argue that this thing is eternal.

ANSWER: the soul [or psyche]

[10] Socrates claims that this virtue can be found in the appetitive part of the soul and correspondingly in the tradesmen of the city. This virtue, wisdom, courage, and justice are the four virtues identified in the ideal city.

ANSWER: moderation

12. Prague was the setting of two defenestrations, the first in 1419 and the second in 1618. For 10 points each:

[10] The First Defenestration of Prague was a point of contention that led to these conflicts, which ended in 1434 with begrudging acceptance of the Utraquists by the King of Bohemia.

ANSWER: Hussite Wars

[10] The Second Defenestration of Prague started this war, in which the Battle of White Mountain was fought. It actually lasted as long as its name suggests and was ended by the 1648 Peace of Westphalia.

ANSWER: Thirty Years’ War

[10] The Holy Roman Emperor at the time of the Second Defenestration of Prague was this childless Habsburg, who named his zealously Catholic cousin Ferdinand II as heir.

ANSWER: Matthias

13. The Black Sea Deluge hypothesis posits that this body of water formed when water from the Sea of Marmara breached a sill. For 10 points each:

[10] Name this body of water that marks the continental border between Europe and Asia. Along with the Dardanelles, it forms the Turkish Straits.

ANSWER: Bosphorus

[10] This most populous city in Turkey overlooks the Bosphorus and used to be called Byzantium and Constantinople.

ANSWER: Istanbul

[10] This city, the fourth most populous in Turkey, lies on the shores of the Sea of Marmara and was the site of a major siege in 1326 that crippled the Byzantine empire.

ANSWER: Bursa

14. One of these beings had his wing broken; another had fourteen pits dug for him; and another was turned into a leopard. For 10 points each:

[10] Name these beings, including Tammuz, the Allalu bird, a lion, a horse, and a shepherd. All met unpleasant fates due to association with a certain goddess.

ANSWER: lovers of Ishtar

[10] Ishtar tried to make this man her lover as well, but he refused, citing the unpleasant fates of her previous lovers. This “two-thirds divine” man goes to see Utnapishtim to find the secret of immortality after his friend Enkidu dies.

ANSWER: Gilgamesh

[10] In one myth, Ishtar descends to the Underworld and is imprisoned by Ereshkigal and Namtar. Asu-shu-namir, an intersex being, is then created by Ea and sent to bring Ishtar back, allowing humans to do this thing.

ANSWER: have sex [accept equivalents that mean the same thing; prompt on produce children]

15. This author wanted to write a morally educational novel about good and evil, but which also had a fair amount of smut in it. For 10 points each:

[10] Name this writer who intended to debase the beautiful Sheila Lamont, but who fell in love with Lamont himself, and eventually had a son named Orlick. A description is acceptable.

ANSWER: Dermot Trellis [accept either underlined part; accept descriptive answers like “that fictional author in At Swim-Two-Birds” which establish he’s a character in that book]

[10] Dermot Trellis is a fictional character created by the narrator of *At Swim-Two-Birds*, which itself was written by this Irish author of *The Third Policeman*.

ANSWER: Flann O’Brien [or Brian O’Nolan]

[10] Trellis creates a character with this first name to illustrate depravity and punishment. This is also the first name of the author of “The Flea” and “A Valediction: Forbidding Mourning.”

ANSWER: **John** [or **John** Furriskey, or **John** Donne]

16. For 10 points each, answer the following about a quantity defined in kilojoules per mole that is often shown as an example of a periodic trend.

[10] This quantity is equal to the amount of energy needed to break off an element’s valence electron. It generally increases left to right on the periodic table.

ANSWER: **Ionization energy**

[10] This quantity appears in the denominator of the equation for determining ionization energy and is equal to h -bar over electron mass times the speed of light times the fine structure constant.

ANSWER: **Bohr radius**

[10] Orbital correction and electron correlation are two error sources in this theorem. This theorem states that negative the energy of the highest occupied molecular orbital is equal to the first ionization energy.

ANSWER: **Koopman’s** theorem

17. A novel whose title says that these two men “Must Die!” reimagines them as a Laurel-and-Hardy style comedy duo. For 10 points each:

[10] Name these Italian-born US Galleanists who were sentenced to death during a controversial trial, in which they were accused of first-degree murder during a shoe factory robbery.

ANSWER: Nicola **Sacco** and Bartolomeo **Vanzetti**

[10] Sacco and Vanzetti were convicted of murders committed in this Massachusetts town. This Norfolk County town was the birthplace of both John Adams and John Quincy Adams as well as John Hancock.

ANSWER: **Braintree**, MA

[10] This judge oversaw the Sacco and Vanzetti case and was widely criticized for his bias. His house in Worcester, MA was destroyed when Galleanists sent him a dynamite package in retaliation for the trial.

ANSWER: Webster **Thayer**

18. This author claimed that Shakespeare’s worst villains, such as Macbeth and Iago, were “little lamb[s]” whose “imagination...stopped short at a dozen corpses. Because they had no ideology.” For 10 points each:

[10] Name this author, who criticized the Soviets’ ideology in *The Gulag Archipelago*, and depicted gulag life in *One Day in the Life of Ivan Denisovich*.

ANSWER: Aleksandr **Solzhenitsyn**

[10] This Romanian-born novelist wrote about Germans in Romania being deported to the gulags in her novel *The Hunger Angel*. This author also wrote about four friends reading Lola’s diary in *The Land of Green Plums*.

ANSWER: Herta **Müller**

[10] Although not about gulags, this Dostoevsky novel is based on his imprisonment in the earlier *katorga* labor camps. In it, the aristocratic Alexander Goryanchikov tries to adapt to life in the barracks.

ANSWER: *The* **House of the Dead**

19. Answer the following about the exciting world of art vandalism, for 10 points each:

[10] In 1914, suffragette Mary Richardson attacked this Diego Velázquez painting with a meat cleaver because she didn’t like the way men “gaped ... all day long” at its depiction of a nude woman admiring herself in a mirror.

ANSWER: the **Rokeby Venus** [or *The* **Toilet of Venus**, **Venus at her Mirror**, **Venus and Cupid**, or **La Venus del espejo**]

[10] The “Guerilla Art Action Group” removed Kasimir Malevich’s *White on White* from this New York museum and replaced it with their manifesto. The group was angry that this museum also home to Dali’s *The Persistence of Memory* and Van Gogh’s *Starry Night* had remained open during the Vietnam War.

ANSWER: the **Museum of Modern Art** [or **MoMA**]

[10] Canadian artist Jubal Brown’s unique method of “performance art” vandalism involved eating red food and vomiting on a painting from this movement called *Harbor at le Havre*, by artist Raoul Dufy. Its other members included Maurice de Vlaminck, who painted several boats on the Seine.

ANSWER: **Fauvism** [or Les **Fauves**]

20. The effects of this process are correlated to phytoplankton productivity, since this process displaces, warm, nutrient-poor water with cold, nutrient-rich water. For 10 points each:

[10] Name this process of water circulating vertically in oceans that is caused by the pressure gradient force from Ekman transport and another force.

ANSWER: **upwelling**

[10] The other force that affects the pressure gradient force is this one, which balances the pressure gradient in a geostrophic current. This force is actually a pseudo-force exhibits by objects in a rotating reference frame.

ANSWER: **Coriolis** force

[10] When analyzing the Navier-Stokes equations in ocean sciences, one may make this approximation, in which only the terms in the horizontal equations are the Coriolis force and pressure. Scientists working on this "scale" of meteorology frequently study cyclones and other structures greater than 1,000 kilometers in horizontal length.

ANSWER: **synoptic** scale