

2019 Terrapin: Come on Angel, Come and Save Us

Packet 5

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Tossups

1. **This non-Shakespearean character exclaims “A horse – A horse – A kingdom for my horse!” during a battle in which he fights alongside Chinese emperors and hussars. This character’s teeth and jaw are violently broken by a character who later gives him a weapon with which he cuts off the seven heads of an adversary. Alexandre Dumas removed darker elements from the story in which this character appears. This character, believed to be an (\*) incarnation of Drosselmeyer’s nephew, is saved from an attack by a girl who throws a slipper at his opponent. Maria’s parents deny that she saw this character leading an army into battle against the Mouse King. For 10 points, name this toy who comes alive in an E. T. A. Hoffmann story that inspired a Tchaikovsky ballet.**

ANSWER: the Nutcracker [or Der Nussknacker]

<AP, European Literature>

2. **In 2007, residents of a city in this state came up with the idea of running naked every Halloween wearing only a pumpkin on their heads, after which a public nudity law was passed. It’s not Montana, but the Stanley Hotel in this state inspired Stephen King’s novel *The Shining*. After a surveyor claimed that a park in this state would make a good beer garden, his companion dubbed it the “Garden of the (\*) Gods” instead. An airport in this state is the subject of conspiracy theories thanks to its strange murals and swastika-shaped runways. A Pueblo dwelling called the Cliff Palace can be found in this state’s Mesa Verde National Park. A city in this state named after its “Springs” is the location of the US Air Force Academy. For 10 points, name this state whose cities include Boulder and Denver.**

ANSWER: Colorado

<AP, Other>

3. **Don Kulick explored how transgender prostitution shaped gender norms in this country in his book *Travesti*. In a seminal 1993 ethnography, a thinker argued that mothers in this country hastened the deaths of infants they perceived as lacking the “knack” or “taste” for life. In addition to that ethnography, *Death Without Weeping*, a myth from this country about a boy who rapes his mother and is then forced by his father to perform a series of tasks, such as capturing a macaw, is labeled M1 and is presented as the “key myth” in *The (\*) Raw and the Cooked*. Claude Lévi-Strauss extensively studied the Bororo people in this country, where Nancy Scheper-Hughes did fieldwork in shantytowns called *favelas*. For 10 points, the Pirahã and the Tupi are indigenous to what South American country that contains most of the Amazon?**

ANSWER: Brazil [or Brasil]

<CK, Social Science>

4. **General-purpose APIs for these things, like CUDA, let developers define functions called “kernels” that are executed in parallel by several different threads when called. The cuDNN library is used with these things to implement deep neural networks and accelerate frameworks like Tensorflow. These devices execute a kind of program with “fragment” and “vertex” types called a (\*) shader. Shaders are executed as part of a pipeline in which these devices perform rasterization and output color information to framebuffers. The open-source API OpenGL is used to interface with these devices; another such API is Microsoft’s DirectX. For 10 points, name these specialized processors manufactured by companies like AMD and Nvidia, used to render images for display.**

ANSWER: **GPUs** [or **graphics processing units** or **GPGPU**; accept **video cards** or **graphics cards**; prompt on **processors**]

<WC, Other Science: Computer Science>

5. **An author from this country depicted himself as a chain-smoking 23-year-old who dances with the protagonist's lover at an engagement party held at a Hilton. The Border City Gazette prints predictions of future events in a novel from this country in which a murder committed at a pastry shop is caught on a hidden tape recorder. An assassin steals poems by an expatriate from this country from a Frankfurt apartment. An author from this country wrote a novel in which the protagonist (\*) saves artifacts such as matchbooks and postcards that remind him of Füsün, and a novel in which a staging of the play *My Fatherland or My Head Scarf* is followed by a staged military coup. A novel from this country opens with the poet Ka travelling to Kars in a snowstorm. For 10 points, *The Museum of Innocence* and *Snow* are by what country's author Orhan Pamuk?**

ANSWER: **Turkey** [or **Türkiye**]

<GR, World/Other Literature>

6. **In a film set in this country that uses many long takes, the protagonist's daily routine is disrupted when she realizes that her potatoes have been on the stove for too long. That film, in which the title character murders her client using scissors after she experiences an orgasm, was directed by Chantal Akerman, a native of this country. In another film set in this country, a dwarf is killed on a film set reminiscent of (\*) Bosch's *Last Judgment*. That film, in which two London hitmen go to the title town in this country and wait for orders, was the directorial debut of Martin McDonagh. For 10 points, name this country that provides the setting for *Jeanne Dielman, 23, quai du Commerce, 1080 Bruxelles* ("zhun d'yell-MAWN, van-TWAH kay du ko-MAIRCE, meel-cat-VAN broo-SELL"), as well as *In Bruges* ("broozh").**

ANSWER: **Belgium** [or **Belge** or **België**]

<NC, Other Arts>

7. **During this monarch's reign, he received the English ambassadors Jerome Bowe and Jerome Horsey. This monarch organized a group of advisors called the "Chosen Council" to reform his administration. This monarch conquered the khanate of Astrakhan. This monarch's capital was burned by Crimean Tatars while he was attacking Poland-Lithuania in the (\*) Livonian War. That war also saw this monarch carry out the Massacre of Novgorod using his newly-created *oprichniki* secret police. This monarch was succeeded by his simple-minded son Fyodor the Bellringer after he had murdered his previous heir, paving the way for his country's Time of Troubles. For 10 points, name this first Russian ruler to be proclaimed tsar, whose epithet refers to his fearsome nature.**

ANSWER: **Ivan the Terrible** [or **Ivan IV** or **Ivan Grozny** or **Ivan Vasilyevich**]

<AE, European History>

8. **This organism codes for an LRR receptor-like kinase that detects flagellin with the FLS2 gene. The GLH gene is required for trichome ("TRY-kohm") development in this organism. The APETALA3 ("APP-uh-tah-luh-3") gene in this organism is regulated by a gene that codes for a zinc finger transcription factor called SUPERMAN. The vacuum infiltration method is used to transform this organism using the *Agrobacterium tumefaciens*, which causes crown galls. This organism's purported non-Mendelian inheritance pattern was shown by crossing parents with mutated copies of the (\*) HOTHEAD gene; that gene typically encodes a protein involved in carpel formation in this organism. For 10 points, the ABC model of flower development was created by observing what plant model organism also known as thale cress?**

ANSWER: *Arabidopsis thaliana* [accept *Arabidopsis*; accept **thale cress** until read]

<VS, Biology>

9. In the preface to a collection of these works, the author encourages the reader to be like “eight-armed Nata” instead of a person who watches a speedy horseman pass by from a narrow window. In one of these works from that collection, a man is asked about his “original face” before his parents were born. In another of these works, Joshu is told (\*) “mu,” which literally means “nothing” or “nothingness,” when asked whether a dog has Buddha-nature. These works, which are often used in the Rinzai school, are compiled in volumes called the *Blue Cliff Record* and *The Gateless Gate*. Línjì composed one of these works that states, “If you meet the Buddha, kill him.” For 10 points, name these short, paradoxical statements used to assist meditation in Zen Buddhism.

ANSWER: koans [or gōng’àn]

<WC, Religion>

10. After finding a signed copy of one of this author’s books, a French inspector asks him if T. S. Eliot is a “known” author and accuses him of murdering one of his own characters. A character created by this author moves to Paris to pursue his true desire of “loafing,” but ends up learning about Vedānta from Shri Ganesha in southern India. In that novel by this author, the protagonist’s ex-fiancée Isabel tempts the alcoholic Sophie into relapse. A novel by this author concerns the Vicar of (\*) Blackstable’s nephew, who has unrequited love for a syphilitic waitress, but finally becomes a doctor and settles down with Sally. In that novel, Mildred’s admirer Philip is dismayed at his prayers’ failure to make his club foot vanish. For 10 points, name this author of *The Razor’s Edge* and *Of Human Bondage*.

ANSWER: William Somerset Maugham (“mawm”)

<AP, British Literature>

11. The final section of this composer’s oratorio begins “Welten singen Dank und Ehre” (“VELT-in ZING-in DONK oont AY-ruh”), and is often performed as a Hallelujah Chorus. Warlike drums and trumpets twice interrupt the B minor Agnus Dei of a mass above whose middle section this composer wrote “Prayer for inner and outer peace.” He reused his song *Gegenliebe* (“GAY-gun-LEE-buh”) for a fantasy whose long solo piano intro modulates from C minor to C major. A mighty 4/4 fugue accompanies the words “In gloria Dei patris, Amen” in his second mass, in (\*) D major, whose Gloria and Sanctus were posthumously premiered in Russia thanks to his patron Prince Galitzin. He composed one oratorio, *Christ on the Mount of Olives*, premiered his own *Choral Fantasy*, and revised and set Schiller’s poem “An die Freude” (“on dee FROY-duh”). For 10 points, name this composer of the *Missa Solemnis* and the “Choral” Ninth Symphony.

ANSWER: Ludwig van Beethoven

<AE, Classical Music>

12. Herbert Yardley was appointed as head of a bureau for this task that was defunded by the Secretary of State Henry Stimson. A woman named Gene Grebel was hired to lead the Venona project for this task. That project took place at Arlington Hall, where many female college students were employed in this task using (\*) “bombe” machines during World War II. Joseph Rochefort’s successful efforts in this task at Station HYPO helped predict an imminent Japanese attack on Midway. In England, Alan Turing worked on this task at Bletchley Park as part of an effort to understand the Enigma system, which was used by Nazi Germany to communicate securely. For 10 points, name this task in which analysts gather intelligence by finding ways to read encrypted messages.

ANSWER: codebreaking [or cryptanalysis or decryption or decoding; accept cryptography; accept signals intelligence or SIGINT; prompt on reading messages or intercepting messages; prompt on intelligence, espionage, or equivalents for spying by asking “what specific kind of intelligence is being done?”; do not accept or prompt on “encryption,” “encoding,” “code-talking,” or anything that suggests hiding a message]

<AE, American History>

13. For the electromagnetic field, this quantity is a contraction of the field strength tensor plus a matter interaction term, and its invariance under Lorentz transforms implies that Maxwell’s equations are consistent with special relativity. Generalized momenta are derivatives of this quantity with respect to

**generalized coordinates. When this quantity has continuous symmetries, Noether's ("NUR-tuh's") theorem gives conserved quantities, such as conservation of energy when this quantity does not depend explicitly on time. This quantity is integrated to find the (\*) action, which is minimized in Hamilton's principle. The calculus of variations is used to derive equations of motion from this quantity; those equations are named for Euler and the namesake of this quantity. For 10 points, name this quantity from classical mechanics equal to kinetic minus potential energy, named for a French mathematician.**

ANSWER: Lagrangian [accept Lagrangian density]

<GR, Physics>

**14. In one paper, this thinker argued that theories are ontologically committed to entities that appear as bound variables of their quantifiers. In that paper, he attacked the fictional philosopher McX who argues that Pegasus is an idea in the mind, and described a problem "frequently dulled on Ockham's razor." He analogized science to a "web of belief" whose "boundary conditions are experience" in a paper which argues that (\*) synonymy cannot be defined as interchangeability. This thinker, who discussed the problem of "Plato's beard" in "On What There Is," criticized Rudolf Carnap for attempting to reduce meaning to talk about sense-data. For 10 points, name this philosopher who attacked the analytic-synthetic distinction in "Two Dogmas of Empiricism."**

ANSWER: W. V. O. Quine [or Willard Van Orman Quine]

<CK, Philosophy>

**15. A member of this family has a nightmare in which a crowd of people force her to dive into a swimming pool to retrieve a can of coffee. That character's brother angrily argues with this family's mother Bessie after she interrupts him reading a script in the bathtub. A member of this family faints in a restaurant after describing a book about a Russian peasant's quest to learn how to pray without ceasing to her disinterested boyfriend (\*) Lane Coutell. The first member of this family to appear on the quiz show "It's a Wise Child" commits suicide after telling the young Sybil Carpenter a story about creatures that gorge themselves to death in "A Perfect Day for Bananafish." For 10 points, Franny, Zooey, and Seymour are members of what family created by J. D. Salinger?**

ANSWER: the Glass family

<CK, American Literature>

**16. At the Battle of Taginae, this empire's forces assumed a crescent-shaped formation, allowing them to resist a cavalry attack, whose participants were ordered to only use spears. In honor of a ruler of this empire, a governor named Smaragdus erected the Column of Phocas. A "catepanate" held by this empire was conquered by Robert Guiscard ("geese-CAR") after he took the city of Bari. Until (\*) Ravenna was conquered by the Lombards in 751, it served as the capital of an "exarchate" of this empire in Italy. The Ostrogothic leader Totila was defeated by this empire's general Narses, who was sent to Italy during the Gothic War after this empire recalled the general Belisarius. For 10 points, name this empire, which sought to reconquer Italy during the reign of Justinian I.**

ANSWER: Byzantine Empire [or Eastern Roman Empire; prompt on Roman Empire]

<WC, European History>

**17. In Mormon folklore, David W. Patten is said to have seen this person, describing him as a naked hairy man, which gave rise to this person's identification with Bigfoot. In the Quran, God sent a raven to this person in order to show him how to scratch up the earth. A descendant of this man named Lamech spoke a poem called the "Song of the Sword," declaring that if this man is avenged (\*) sevenfold, Lamech should be avenged seventy-sevenfold. This man received a mark from God and lived in the land of Nod after being told that he would be "a fugitive and wanderer on the earth." After this man asked, "Am I my brother's keeper?," God told him**

that his brother's blood "is crying to me from the ground." For 10 points, what man from the Book of Genesis killed his brother Abel?

ANSWER: **Cain** [or **Qayin** or **Qabil**]

<WC, Mythology>

18. **He's not Chardin ("shar-DAN") or Millais ("mill-AY"), but this artist's depiction of a boy blowing soap bubbles was inspired by the treatment of that subject by his teacher, the academic painter Thomas Couture ("toh-MAH koo-TOOR"). Like Degas, this painter depicted horse racing, using an unusual frontal perspective in *The Races at Longchamp* ("long-SHAWM"). In one of this artist's canvases, the legs of a trapeze walker and an opulent chandelier can be seen in a large (\*) mirror behind a bar with a bowl of oranges and bottles of champagne. Another of his paintings shocked Parisian audiences despite its seated figures replicating the pose of three river gods in Raphael's *Judgment of Paris*. This painter of *A Bar at the Folies-Bergère* ("foh-LEE-bair-ZHAIR") depicted two contemporarily dressed men with naked woman in that work, which was displayed at the Salon des Refusés ("sa-LAWN day ruh-fyoo-ZAY"). For 10 points, name this French painter of *The Luncheon on the Grass*.**

ANSWER: Edouard **Manet**

<GR, Painting & Sculpture>

19. **A process named for these materials that results in rigidity proceeds through a vastly degenerate free energy landscape. The Krogh–Moe model describes boron-based examples of this material, which were investigated for bioactive applications. The structure of this material can be described by a random network theory of ionic polyhedra developed by W. H. Zachariasen, based on X-ray studies of this material. A spike in heat capacity measured with DCS indicates a transition named for this material. (\*) Potash ("pot-ash") and lead oxide are common additives used in the manufacture of this amorphous material. For 10 points, obsidian is a naturally occurring form of what amorphous material made from molten sand with blowing techniques?**

ANSWER: **glass** [accept silicate **glasses** or borate **glasses**; accept **glass** transition (temperature); prompt on **amorphous** materials in the first sentence]

<GR, Chemistry>

20. **George Cœdès ("say-DESS") created an 8-volume book of transcriptions from this empire's ruins while working for the EFEO. Roland Fletcher of the University of Sydney has used remote sensing technologies to rediscover canals once built by this empire. This empire's customs were recorded by the Chinese diplomat Zhōu Dáguān ("joe da-gwen"), who also described its artificial lakes called (\*) *barays* ("ba-RYES"). This empire's capital contained a Buddhist temple called Bayon ("by-YOHN") with numerous depictions of its builder Jayavarman VII as Avalokiteshvara ("uh-vuh-loh-kee-TAYSH-vuh-ruh"). Another temple complex in the same capital has five towers symbolizing the peaks of Mount Meru, and was built by this empire's ruler Suryavarman II. For 10 points, name this Southeast Asian empire that had its capital at Angkor.**

ANSWER: **Khmer** Empire [accept **Cambodian** Empire; accept **Angkor** empire until "Angkor" is read]

<AE, World History>

## Bonuses

1. This case arose when David Jerome attempted to forcefully allot Kiowa (“KYE-oh-wuh”) lands in violation of the Medicine Lodge Treaty. For 10 points each:

[10] Name this 1903 Supreme Court case which held that Congress had the authority to unilaterally abrogate treaty obligations with Native American tribes.

ANSWER: Lone Wolf v. Hitchcock [accept either underlined part]

[10] The Medicine Lodge Treaty was abrogated by this 1887 law, which aimed to make Native Americans into farmers by distributing reservation lands among individuals, then put the “surplus” land up for public sale.

ANSWER: Dawes Act [or Dawes Severalty Act of 1887 or General Allotment Act]

[19] The *Lone Wolf* case arose in Indian Territory, which eventually became this US state to which many white settlers came in the 1889 “Land Run.” “Sooners” in this state entered the territory without government permission.

ANSWER: Oklahoma

<CK, American History>

2. The change in wavelength due to this phenomenon is proportional to one minus cosine theta. For 10 points each:

[10] Name this scattering process between an electron and a photon, contrasted with lower-energy Thomas scattering. Its cross section can be derived from the Klein–Nishina formula.

ANSWER: Compton scattering [or Compton effect]

[10] In this process, electrons radiate when they hit a metal target due to large acceleration. It produces the continuous spectrum of X-ray tubes, and its name means “breaking radiation.”

ANSWER: bremsstrahlung

[10] The radiation field from an accelerating point charge can be calculated from a potential partially named for this French physicist. He derived a relativistic generalization of Larmor’s formula for the total power radiated by a point charge.

ANSWER: Alfred-Marie Liénard (“lee-ay-NARR”) [do not accept “Lennard” or “Lennard-Jones”] (The potential is the Liénard–Wiechert potential.)

<GR, Physics>

3. A post on this blog describes a conversation in which “Professor Hunk” complains about the “oppression olympics” to a Jewish colleague. For 10 points each:

[10] Name this fictional blog written by Ifemelu, a Nigerian student at Princeton University. Another post on this blog was inspired by the two suitors of a hairdresser at the Trenton salon where Ifemelu has her hair braided.

ANSWER: “Raceteenth” [or “Raceteenth or Various Observations About American Blacks (Those Formerly Known as Negroes) by a Non-American Black”]

[10] Ifemelu’s teenage romance with Obinze in Lagos and struggles while at Princeton are outlined in *Americanah*, a 2013 novel by this Nigerian author of *Purple Hibiscus*.

ANSWER: Chimamanda Ngozi Adichie (“uh-DEE-chee-ay”)

[10] In *Americanah*, one of Ifemelu’s classes discusses the censorship of offensive words in the film adaptation of this Alex Haley novel that describes the enslavement of Kunta Kinte and his descendants in North America.

ANSWER: Roots

<AP, World/Other Literature>

4. This artist included a phallic rocket on a wafer called the *Moon Museum* that was sent to the moon on Apollo 12. For 10 points each:

[10] Name this artist who used photos of Buzz Aldrin from Apollo 11 for his brightly colored *Moonwalk* series of silkscreens. This artist’s other silkscreens include *Marilyn Diptych*.

ANSWER: Andy Warhol

[10] This artist's contribution to the *Moon Museum* is a single line. He used photos and lithographs of the space shuttle for his collage *Hotshot*, and used found objects and paintings in his characteristic "combines," such as *Bed and Canyon*.

ANSWER: Robert **Rauschenberg**

[10] This artist also used imagery from the space program, such as the launch towers depicted in *Waiting* and *Gemini Launch Pad*. This grandson of an illustrator and son of another artist also did a posthumous portrait of JFK.

ANSWER: **Jamie Wyeth** [prompt on Wyeth] (His father is Andrew Wyeth, and his grandfather is N. C. Wyeth.)  
<GR, Painting & Sculpture>

5. In finite games with perfect information, this method always calculates a subgame perfect Nash equilibrium. For 10 points each:

[10] Name this optimization technique in game theory that involves iteratively reasoning from the final decision node to the initial decision node in an extensive form game.

ANSWER: **backward induction** [accept **backward chaining** or **backward inference**; prompt on induction]

[10] Backward induction makes unrealistic predictions in this game in which one actor proposes a division of a sum of money that the second actor can either accept or reject, in which case neither actor gets any money.

ANSWER: **ultimatum** game [do not accept "dictator game"]

[10] If this game is played a finite number of times, backward induction finds that the two players defect in each subgame. Played a single time, this game's Nash equilibrium has both players choosing to defect over cooperate.

ANSWER: **prisoner's dilemma**

<CK, Social Science>

6. Karl Mauch ("MAO'kh") falsely identified this archeological site as the biblical city of Ophir ("OH-fur"), though in 1905, David Randall-MacIver ("Randall muh-KYE-ver") correctly identified this site to be of African origin. For 10 points each:

[10] Name this archaeological site home to the Great Enclosure and many soapstone bird statues. This site lent its name to the African country in which it is located, whose capital is Harare.

ANSWER: Great **Zimbabwe**

[10] Great Zimbabwe was constructed by this ethnic group, which is also the largest in modern-day Zimbabwe. A leader from this ethnic group named Nyatsimba created the Mutapa Kingdom.

ANSWER: **Shona** [accept **Karanga**]

[10] Mutapa was a major producer of this resource that was exported to the Portuguese through the port of Sofala. Large amounts of this resource were discovered in Witwatersrand ("vit-VOT-ers-ROND") in 1886.

ANSWER: **gold**

<AE, World History>

7. Peaks in this technique correspond to modes like scissoring or stretching, and those modes must involve a change in dipole moment to be "active" for this technique. For 10 points each:

[10] Name this type of spectroscopy that probes the vibrational energy structure of molecules using light whose wavelength is longer than visible light.

ANSWER: **infrared** spectroscopy [or **IR** spectroscopy]

[10] This part of the infrared absorption spectrum from around 1500 to 500 inverse-centimeters contains characteristic absorption valleys for different molecules.

ANSWER: **fingerprint** region

[10] Raman spectroscopy can probe the vibrational structure of molecules or surfaces by measuring this shift in the frequency of scattered light. This shift is due to molecules gaining or losing vibrational energy during scattering.

ANSWER: **Stokes** shift [accept **Stokes** or anti-**Stokes** scattering]

<GR, Chemistry>

8. In one of this author's plays, Val arrives in town and falls in love with Lady, but Jabe shoots her and Val is pushed into a burning building by the chief and firemen with hoses. For 10 points each:

[10] Name this author of *Orpheus Descending* who also used his sister Rose as the model for Laura Wingfield in his play *The Glass Menagerie*.

ANSWER: Tennessee **Williams**

[10] A stranger also comes to town in this Mark Twain short story in which that stranger leaves a sack that supposedly contains 40,000 dollars in gold, eventually leading the town to change its motto to "Lead us into temptation."

ANSWER: "The **Man that Corrupted Hadleyburg**"

[10] In this play, a stranger comes to town and dances with Madge while her younger sister Millie gets drunk on whisky. That stranger, Hal, later has to jump onto a train to avoid the police after the jealous Alan falsely accuses him of stealing.

ANSWER: **Picnic** (by William Inge)

<JH, American Literature>

9. Her career broke out after she played Violetta in the 2005 Salzburg Festival production of *La traviata* alongside the curly-haired Mexican-French tenor Ronaldo Villazón. For 10 points each:

[10] Name this dark-haired Russian soprano, the world's most sought after diva. She was discovered and mentored by Mariinsky ("ma-RIN-skee") Theater director Valery Gergiev ("vuh-LAIR-ee GAIRG-yiff").

ANSWER: Anna **Netrebko**

[10] In a high-production 2008 film of this verismo opera by Puccini, Netrebko and Villazón star as the frail seamstress Mimì and the poor poet Rodolfo who fall in love in snowy Paris. It's the Met's most performed opera.

ANSWER: *La bohème* ("bo-EM")

[10] Netrebko opened a record third consecutive Met season as Tatiana, who sings the "Letter scene" alone in this dark drama that bookended Galina Vishnevskaya's career. Baritone Yuri Mazurok often sang the title role of this opera whose libretto was by K. S. Shilovsky and the composer, Tchaikovsky.

ANSWER: **Eugene Onegin** [or **Yevgeny Onegin**]

<OL, Other Arts>

10. Answer the following about parents in Hindu myth losing their temper with their children. For 10 points each:

[10] In the Katha Upanishad ("CUT-uh oo-puh-nih-shud"), Nachiketas's ("nuh-chih-KAY-tus's") father told him to "go to hell" in a moment of rage; taking this command literally, Nachiketas went to hell and received a discourse from this lord of the underworld, the Hindu death god.

ANSWER: **Yama** [or **Dharmarāja**]

[10] This sage was cursed by his father Brahma ("BRUM-huh") to spend a life on Earth as the son of a maidservant after asking him why humans were forced to procreate. This sage wanders the three worlds chanting "Nārāyana" ("nah-RAH-yuh-nuh"), a name of Vishnu.

ANSWER: **Nārada**

[10] While still a fetus, the sage Ashtavakra ("USH-tuh-vuh-kruh") corrected his father's recitation of some mantras from these four most important Hindu holy scriptures, causing his father to curse him to be born with eight bends in his body.

ANSWER: the **Vedas** [or **Śruti**]

<AP, Mythology>

11. In support of his ally and uncle, King John of England, this monarch invaded France but was decisively defeated by Philip II Augustus at the Battle of Bouvines ("boo-VEEN"). For 10 points each:

[10] Name this Holy Roman Emperor who struggled for control over the Holy Roman Empire with Frederick II Hohenstaufen ("HO-en-shtow-fin"). He was deposed following his defeat at the Battle of Bouvines.

ANSWER: **Otto IV** [or **Otto of Brunswick**]



[10] Otto IV was the only Holy Roman Emperor from this dynasty. This dynasty gave its name to an Italian political faction that supported the pope and opposed the Ghibellines, who supported the emperor.

ANSWER: **Welf** [or **Guelfs** or **Guelphs**]

[10] Otto IV was the son of a duke of Bavaria with this name, called “the Lion.” The fourth Holy Roman Emperor with this name started the lay investiture controversy and undertook the Walk to Canossa.

ANSWER: **Henry** [accept **Henry** the Lion or **Henry IV**]

<WC, European History>

12. Answer the following about instruments found in aircraft cockpits, for 10 points each.

[10] The center of the Primary Flight Display shows information about this property, quantified by yaw, pitch, and roll rotations about the aircraft’s principal axes. Euler (“OY-ler”) angles and unit quaternions also describe this property for a rigid body.

ANSWER: **orientation** [or **attitude**; or **angular position**]

[10] VOR, the standard aircraft navigation system, utilizes signals in the Very High Frequency band of this longest-wavelength region of the electromagnetic spectrum.

ANSWER: **radio** waves

[10] In addition to gyroscopic instruments, the common “six-pack” of flight instruments includes a set that measures the pressure at the end of one of these tubes to produce readings for altitude or velocity.

ANSWER: **pitot** (“PEE-toh”) tubes [accept **pitot**-static tubes]

<AP, Other Science: Engineering>

13. In January 2019, this legislator proposed in a *60 Minutes* interview that the top-level marginal income tax rate could be raised to 60 or 70 percent to fund a “Green New Deal.” For 10 points each:

[10] Name this recently-elected US representative from New York City. A member of the Democratic Socialists of America, she won election after launching a successful primary challenge against Joe Crowley.

ANSWER: Alexandra **Ocasio-Cortez** [accept **AOC**]

[10] Currently, many high-earning individuals in America pay this tax with 26 and 28 percent brackets instead of the normal income tax, preventing them from using deductions to completely avoid paying taxes.

ANSWER: **alternative minimum** tax [or **AMT**]

[10] High-income earners can avoid paying taxes on earnings and withdrawals from their retirement savings by funding a “backdoor” one of these retirement accounts. Individuals must earn less than 122,000 dollars a year to be eligible to contribute to these accounts.

ANSWER: **Roth IRA** [or **Roth Individual Retirement Account**; prompt on **Roth** or **IRA** or **Individual Retirement Account**; do not accept or prompt on “Traditional IRA” or “Roth 401(k)”]

<CK, Other>

14. When Voltaire, a dedicated pen-pal of this king, first met him, he took this king’s pulse “just as if [he] was [this king’s] first physician.” For 10 points each:

[10] Name this Prussian king who stated that the Middle High German epic *Nibelungenlied* (“nee-buh-LUNG-in-lead”) was “not worth a shot of powder.” This “enlightened” king’s dabbling in the arts also led him to write numerous flute sonatas.

ANSWER: **Frederick the Great** [or **Frederick II**; or **Friedrich der Grosse**; or **Friedrich II**; prompt on **Frederick**]

[10] This author, who didn’t get along with Frederick, stated that comparing the *Nibelungenlied* and the *Iliad* is a “pernicious endeavor.” One of his characters plays Hamlet in an acting troupe after being rejected by Mariane and realizes that his whole life is an “apprenticeship.”

ANSWER: Johann Wolfgang von **Goethe** (“GUR-tuh”) (The novel is *Wilhelm Meister’s Apprenticeship*.)

[10] This poet asserted that a Frenchman can “scarcely get any idea” of the *Nibelungenlied*. Much of this author’s verse, including “The North Sea” and the rest of his “Buch der Lieder” (“BOOKH dair LEE-duh”), were later set to music.

ANSWER: Heinrich **Heine** (“HY-nuh”)  
<AP, European Literature>

15. This leader’s ideology was based on six tenets he called “arrows,” including state secularism. For 10 points each:  
[10] Name this leader whose attempts to modernize Turkey included the 1925 Hat Law, banning the wearing of the fez, and the closing of Sufi meeting places called *tekkes*.

ANSWER: Mustafa **Kemal Atatürk** [accept either underlined name]

[10] Atatürk borrowed the name of his policy of state secularism from this earlier French term. The 1905 Law on the Separation of the Churches and the State forms the basis for the French policy of secularism known by this term.

ANSWER: **laïcité** (“la-ee-see-TAY”) [or **laiklik**]

[10] In 1923, Atatürk’s government negotiated this treaty with the Allied forces occupying Turkey. This treaty overturned the Treaty of Sèvres (“SEV-ruh”), which would have ceded eastern Thrace and part of the Anatolian coast to Greece.

ANSWER: Treaty of **Lausanne** (“lo-ZANN”)

<AP, European History>

16. This philosopher argued that a good life is characterized by both the absence of pain, or *aponia*, and tranquility, or *ataraxia*. For 10 points each:

[10] Name this Greek philosopher who argued that pleasure was the greatest good.

ANSWER: **Epicurus**

[10] The Epicureans superseded an earlier group of hedonist philosophers led by Aristippus, who were based in this namesake African city.

ANSWER: **Cyrene** (“sigh-REE-nee”)

[10] The Epicurean philosopher Lucretius argued that if humans have free will, atoms could not always fall, but must also have this unpredictable characteristic.

ANSWER: **clinamen** [or **swerve**]

<CK, Philosophy>

17. This instrument is played by Lily Afshar, Xuefei Yang (“shweh-fay yong”), Ana Vidović (“VEE-do-vitch”), and Sharon Isbin, who founded Juilliard’s (“JOO-lee-ard’s”) department for it. For 10 points each:

[10] Name this six-stringed instrument played by Christopher Parkening, Andrés Segovia, and Julian Bream that often accompanies a flamenco singer.

ANSWER: **guitar** [accept acoustic **guitar** or classical **guitar** or electric **guitar**]

[10] Although this Spanish composer from Catalonia didn’t write for guitar, arrangements by Llobet (“yoo-BET”), Tárrega, and Segovia of his *Tango in D* and *Asturias (Leyenda)* are now staples of the classical guitar repertoire.

ANSWER: Isaac **Albéniz** (“EE-sock all-BAY-neese”)

[10] Carlos Montoya’s recording made this sixth movement of Ernesto Lecuona’s *Suite Andaluía* a popular guitar standard. Its title is a rarely-danced style of flamenco in free time named for the southern Spanish city that also titles the tenth piece in Albéniz’s *Iberia*.

ANSWER: **Malagueña** (“ma-la-GAIN-yah”) [prompt on **Málaga**]

<AE, Classical Music>

18. XPB and the XPD genes, which are named for types of xeroderma pigmentosum, are involved in one form of this process. For 10 points each:

[10] Name this process that addresses errors like cyclobutane-pyrimidine dimers.

ANSWER: **DNA repair** [accept **nucleotide excision** repair or **NER**; prompt on **repair**]

[10] Strand breaks repaired by non-homologous end joining disrupt this two-stranded geometric structure of DNA proposed by Watson and Crick and supported by the X-ray crystallographic studies of Rosalind Franklin.

ANSWER: **double helix** [prompt on **helix**]

[10] This other form of DNA repair corrects base pairing errors and is carried out by DNA polymerase delta. Genes MHL1 and MSH2 are involved in cutting and recognition in this form of DNA repair. Mutations in those genes are responsible for the majority of hereditary colon cancer.

ANSWER: **mismatch** repair [or **MMR**]

<GR, Biology>

19. Two characters in this play come up with the name “T. S. Eliot and Pam” for their imaginary band and pretend to search for somebody called “nobody.” For 10 points each:

[10] Name this play in which Jimmy Porter launches a series of tirades at his wife Alison. Jimmy has an affair with Alison’s friend Helena, but reconciles with Alison by playing the “bear and squirrel game” after she miscarries.

ANSWER: ***Look Back In Anger***

[10] As it depicted the everyday life of a working-class family, John Osborne’s *Look Back in Anger* pioneered the “kitchen sink” style of this movement, which attempts to present life as it is.

ANSWER: **realism** [or **realist**]

[10] Act I of the play opens with Alison doing this activity, which caused audiences to gasp when the curtain was raised on its opening night. Act III opens nearly identically, but with Helena doing this activity instead.

ANSWER: **ironing** clothes [accept any answer indicating the use of an **iron** or **ironing** board]

<AP, British Literature>

20. *Description acceptable.* An example of one of these works called *The Message* uses a paraphrase-driven approach, exemplified by imagery like “you don’t hang out at Sin Saloon” in its rendering of Psalm 1. For 10 points each:

[10] Name these works, which more typically follow the approaches of dynamic or formal equivalence. The King James Version was one of these works commissioned during the reign of James I.

ANSWER: **Bible translations** [accept **English** versions of the **Bible** or anything indicating that the **Bible** is being **translated** into a different language; prompt on **Bibles** by asking “What specifically has been done to the Bible?”]

[10] Brian Metzger oversaw the creation of this Bible translation, which has been criticized by some conservative Christians for its use of gender-neutral terms at the request of its publisher, the National Council of Churches.

ANSWER: **New Revised Standard Version** [or **NRSV**]

[10] Unlike most modern translations such as the NRSV, the King James Version translated the New Testament from the *Textus Receptus*, a Greek text compiled by this Dutch humanist scholar who also wrote *In Praise of Folly*.

ANSWER: Desiderius **Erasmus** [or **Erasmus** of Rotterdam]

<WC, Religion>