



**ACADEMIC
COMPETITION
FEDERATION**

2023 ACF NATIONALS

Prelims 8

Packet By

Berkeley A, UMN B, UNC A

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TOSSUPS

1. One of Emmanuel Levinas's ("LEV-in-ahss's") greatest regrets was mocking this philosopher in a skit in which he covered his hair in white powder and repeatedly intoned "I am a pacifist." A conversation with this philosopher inspired the elliptical design of the reading room of Aby Warburg's library, where this philosopher researched a book that distinguishes "expressive" and "representative" functions of thought. This philosopher emphasized the human capacity for "spontaneous self-expression" in opposition to another philosopher's emphasis on "thrownness" during a 1929 debate on the question "what is it to be a human being?" This philosopher, who debated Martin Heidegger at Davos ("da-VOSE"), defined humans as "symbol-making animals." For 10 points, name this neo-Kantian author of *Philosophy of Symbolic Forms*.

ANSWER: Ernst **Cassirer** ("kah-SEER-er") [or Ernst Alfred **Cassirer**]

<Philosophy>

2. A designer with this first name invented a glass-like fabric called Rhodophane and names a fashion house undergoing a renaissance under Daniel Roseberry. While working as a model, a designer with this first name created a teardrop-shaped perfume bottle for Halston. That designer with this first name designed a "Bone Cuff" bracelet and "Open Heart" necklace for Tiffany, where she worked until her 2021 death. A woman with this first name created an evening coat embroidered with two reflected faces in an optical illusion drawn by Jean Cocteau. The "shoe hat" was created by a woman with this first name who worked with Salvador Dalí to create a lobster phone and a lobster dress. "Shocking Pink" was the signature color of a designer with this first name who was a rival of Coco Chanel. For 10 points, give this first name of fashion designers with the last names Peretti and Schiaparelli ("SKEE-ah-pah-RELL-ee").

ANSWER: **Elsa** [accept **Elsa** Schiaparelli] (The first sentence refers to Maison Schiaparelli.)

<Other Fine Arts>

3. Former SpiritBank executive Albert Kelly was appointed to head this program shortly after he received a lifetime ban from banking. The 2021 Bipartisan Infrastructure Law reinstated a pair of excise taxes that provided most of this program's budget until they were cut in 1995. The law that created this program placed special requirements on "potentially responsible parties" and established the ATSDR at the Department of Health and Human Services. A score of 28.5 is required to join this program's National Priorities List. A site similar to the Valley of the Drums was publicized by the "mother" of this program, Lois Gibbs. A pledge to restore this program to "its rightful place at the center" of an agency headed by Scott Pruitt sought to address 114 sites in New Jersey. This program operates a Hazard Ranking System. For 10 points, name this EPA program that provides federal relief for polluted sites like Love Canal.

ANSWER: **Superfund** [or **CERCLA**; or **Comprehensive Environmental Response, Compensation, and Liability Act** of 1980; accept **Superfund** excise taxes] (The ATSDR is the Agency for Toxic Substances and Disease Registry.)

<American History>

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4. A set of variations on a melody by this composer for flute and piano is Frédéric Chopin's ("sho-PAN's") earliest chamber work. A melody by this composer inspired Niccolò Paganini to write a virtuosic set of variations on one string for violin and orchestra. Robert Pearsall arranged a pastiche of this composer's music in which two soprano soloists only sing the word "meow." This composer wrote pieces called "Sins of Old Age" for Parisian salons that he hosted after his early retirement from writing opera. An aria by this composer climaxes with repetitions of the title character's name on the notes "E D C," emphasizing how he is in demand. An overture by this composer that opens with a dramatic cello solo includes a "Ranz des Vaches" ("ron day vahsh") and a "March of the Swiss Soldiers." For 10 points, name this composer of *William Tell* and *The Barber of Seville*.

ANSWER: Gioachino ("joh-ah-KEE-no") **Rossini** [or Gioachino Antonio **Rossini**] (Paganini's "Moses Fantasy" was inspired by Rossini's opera *Mosè in Egitto*.)

<Classical Music>

5. In a formula derived by Hans Daetwyler ("DAT-why-ler") and colleagues, the accuracy of disease risk predictions increases with both this quantity expressed on an entry-mean basis and training population size. Brendan Maher described the problem of some of this quantity being "missing," which GCTA analyses were introduced in order to solve. For dichotomous traits, this quantity may be estimated with ACE and other liability threshold models. Response is the product of a form of this quantity and the selection differential. One kind of this quantity excludes variance due to dominant and epistatic factors, while the other is the result of dividing genetic variance by total variance. Those narrow-sense and broad-sense forms of this quantity are often estimated from now-widely-criticized twin studies. For 10 points, name this parameter that represents the variability in a trait due to genetics, not environmental factors or chance.

ANSWER: **heritability** [or **h-squared**; accept narrow-sense **heritability** or broad-sense **heritability**; accept missing **heritability** problem]

<Biology>

6. Tito's Political School is nicknamed for one of these places in a novel by Ivana Bodrožić ("bod-ro-jitch"). An author who called himself a "citizen" of these places wrote a 1924 novel about one in Łódź ("wooch") and 64 pieces of interwar journalism collected in a book titled for their "years." An aunt invites Christine, a girl who works in a post office, to one of these places in Switzerland in a novel by an author who inspired a film titled for one of these places with his "Mitteleuropa" memoir *The World of Yesterday*. The scarred veteran Dr. Otternschlag and the ballerina Grusinskaya are among the title "people at" one of these places in a Weimar-era novel by Vicki Baum that was adapted into a Pre-Code film. In a 1959 novel of "rubble literature," one of these buildings called the Prince Heinrich is where Faehmel plays the title *Billiards at Half-Past Nine*. For 10 points, what kind of building titles a Stefan Zweig-inspired film about the Grand Budapest?

ANSWER: **hotels** [accept **resorts**; accept **conference centers**; accept **hotel** rooms; accept *The Grand Budapest Hotel*; accept Prince Heinrich **Hotel** or **Hotel Prinz Heinrich**; accept *Grand Hotel* or *Menschen im Hotel*; accept *The Hotel Years*; accept **Hotel Savoy**; accept *The Hotel Tito* or *Hotel Zagorje*; prompt on **lodgings** or **rooms** or **suites**; reject "motels"] (The second sentence is about Joseph Roth. Christine appears in *The Post-Office Girl*. Greta Garbo played Grusinskaya in the novel's 1932 film adaptation, *Grand Hotel*. Heinrich Böll wrote *Billiards at Half-Past Nine*.)

<European Literature>

7. Models of this process using integral equation theory, such as RISM, are closed under a mean-spherical approximation. Various models of this process diverge over whether its scaling factor x equals 0, 0.5, or infinity in the expression “epsilon plus x , over x plus 1.” Models of this process iteratively recalculate the polarization of the reaction field until it is self-consistent using a nonhomogeneous equation that sets ρ to be a charge-weighted sum of positive and negative Boltzmann factors. The accessible surface area for this process is slightly less than the van der Waals surface area. A conducting cavity disrupts a dielectric continuum in implicit models of this process like COSMO (“cosmo”) or generalized Born theory. This process reorganizes a shell of point charges around a molecule. For 10 points, name this process in which molecules mix to form a homogeneous liquid solution.

ANSWER: **solvation** [or **dissolving**; accept **dissolution** or forming a **solution** until “solution” is read; prompt on **mixing** until “mix” is read; reject “solubility” or “soluble”]

<Chemistry>

8. A dramatist satirized this modern-day country’s response to a military victory by depicting its aftermath in a cabaret-style musical entitled *You, Me, and the Next War*. A novel from this country is composed of two parallel storylines about a girl who is kidnapped for busking on the street and a boy who finds the busker’s dog and resolves to find its owner. An author from this country wrote the novel *Someone to Run With*, as well as a novel about a comedian who counts the number of people who leave during his increasingly unhinged stand-up routine. Another author from this modern-day country wrote a memoir about his mother Fania’s death and his literary mentor Zelda. *A Tale of Love and Darkness* is by a writer from this country, who described Hannah’s disintegrating marriage in his novel *My Michael*. For 10 points, name this home country of David Grossman and Amos Oz (“ah-MOSE OHZ”), who wrote in Hebrew.

ANSWER: **Israel** [or State of **Israel**; or Medīnat **Yīsrā’el**; or Dawlat **Isrā’īl**; reject “Palestine”] (The dramatist in the first sentence is Hanoah Levin.)

<World Literature>

9. This ruler commissioned Raphaël de Monachis (“mon-ah-SHEE”) to translate *The Prince*, but claimed the text was useless. This ruler allowed for the establishment of a women’s medical school by Antoine Clot (“clo”), who then recruited Theodor Bilharz to research a namesake disease. This ruler sent Niqūlā al-Masābikī to Milan to study European printing presses, then tapped him to head the Būlāq Press. Apollinaire Lebas (“luh-BAH”) was charged with accepting a gift from this ruler in exchange for the donation of a clock tower at the Citadel of Saladin. This ruler’s refusal to sign the Convention of London caused the Oriental Crisis. This ruler broke ground on the Maḥmūdiyyah Canal and employed Joseph Sève (“sev”) to train a model army of Sudanese slaves captured by his son Isma‘il Pasha. This ruler established the Khedivate after Horatio Nelson’s victory at the Battle of the Nile in 1798. For 10 points, name this first Ottoman Wāli of Egypt.

ANSWER: **Muhammad Ali** Pasha [or **Muhammad Ali** of Egypt; **Muhammad Ali** Pasha al-Mas’ud ibn Agha; or **Mehmet Ali** Pasha; or **Muhammad ‘Alī** Bāshā; or Kavalalī **Mehmed Ali** Paşa; reject “Muhammad” or “Ali”]

(Bilharzia is a name for schistosomiasis. Lebas facilitated the transport of the Luxor Obelisks to France.)

<World History>

10. A framework with this noun in its name was formalized in 1994 by a collective of Black women before the International Conference on Population and Development in Cairo, and was launched in a statement that criticized a Clinton administration health plan. Three principles of this concept, including desert (“duh-ZERT”), are analyzed in detail in a 1999 book by David Miller. This is the first title concept of a 1973 book whose chapter “Liberal Formulations” argues that the sociological and geographical imaginations should be combined to understand urban geography; that David Harvey book is titled for this concept “and the city.” An intersectional framework named for this noun extends the similarly named “reproductive rights” and “reproductive health” frameworks. For 10 points, name this concept whose “social” type concerns the fair distribution of opportunities and privileges.

ANSWER: **justice** [accept social **justice**; accept reproductive **justice**; accept *Social Justice and the City*; accept *Principles of Social Justice*]

<Social Science>

11. An essay claims that “to talk about [this concept] is therefore to betray it,” but defends the betrayal with “the goal of self-edification.” An essay on this concept asserts that “to name a sensibility... requires a deep sympathy modified by revulsion” and argues “to patronize the faculty of taste is to patronize oneself.” That essay claims that Jean Genet’s (“zhawn zhuh-NAY’s”) ideas exemplify this concept, but his writing style does not. An essay titled for this concept calls it the “glorification of ‘character’” and lists examples of it like “the Brown Derby restaurant on Sunset Boulevard,” “old Flash Gordon comics,” and “stag movies seen without lust.” An essay interspersed with epigrams from Oscar Wilde is structured as a 58-part list on this concept, whose “ultimate statement” is “it’s good because it’s awful.” For 10 points, what concept was elucidated in an essay of “Notes” by Susan Sontag?

ANSWER: **camp** [accept “Notes on ‘Camp’”]

<American Literature>

12. Aaron Hyman’s 2022 book on this artist discusses how transatlantic spread of Lucas Vorsterman’s engravings of one of his paintings led it to be reproduced in churches across the Andes. Delacroix (“deh-lah-KWAH”), Veronese (“vair-oh-NAY-zay”), and this painter were the primary models for Cézanne (“say-ZAHN”), according to a monograph by Roger Fry. In his *Dialogue on Colors*, Roger de Piles (“ro-ZHAY duh peel”) championed the painterly colorist technique of this artist and ranked him the second-greatest painter after Raphael. A characteristic style of this artist is interpreted as a form of Christian praise in Kenneth Clark’s *The Nude*, which calls him and Titian (“TISH-in”) “the two supreme masters of Natural Venus.” Feminist readings of this artist make note of the virgin and wife archetypes present in a 24-painting series of a female ruler for the Luxembourg Palace. For 10 points, name this Flemish painter whose *Marie de’ Medici* (“MEH-dee-chee”) cycle includes examples of his trademark fleshy women.

ANSWER: Peter Paul **Rubens**

<Painting & Sculpture>

13. A cannibal modifies his throat with this substance to gain access to a sealed cave in the Xhosa (“KOH-suh”) folktale “Demane and Demazana.” Friezes at Musawwarāt es-Sufra (“moo-sa-wa-RAHT eh-SOO-fra”) show this substance being presented to the lion-headed god Apedemak. In a Fon (“fawn”) myth, some of this substance made by aquatic monkeys sustains the cosmic serpent Da, who will destroy the world when its supply runs out. In the Mwindo epic, the people of Yuna gift the title hero items made of this substance before he goes to fight his father. After descending from heaven and clearing a dense forest with help from a dog, a deity agrees to share the secret of making this substance only after other orishas agree to make him chief. Mande craftsmen who work with this substance control an energetic force called nyama. For 10 points, the Yoruba deity Ogun is associated with what substance used to make hoes and machetes?

ANSWER: **iron** [or **Fe**; accept **metal**; prompt on **armor**; reject specific metals other than iron]

<Mythology>

14. Ellis Ashmead-Bartlett's reporting in this place inspired Keith Murdoch to write a letter to Andrew Fisher about its terrible conditions. A book collecting stories and poems by people in this place was published by Arthur Bazley and Charles Bean. John Simpson Kirkpatrick's actions in this place led him to be mythologized as the "Man with the Donkey." Parts of this place were called "Baby 700," "Lone Pine," and "the Nek." Actions in this place led Billy Sing to be dubbed "the assassin" and the "angel of death." A holiday that originally honored events in this place is celebrated with a "gunfire breakfast" and is observed on April 25th. This place is regarded as the birthplace of a nationalistic "legend" named for the joint army corps ANZAC. For 10 points, name this peninsula north of the Dardanelles that British forces attacked in a costly World War I campaign.

ANSWER: **Gallipoli** peninsula [or **Gelibolu** peninsula; accept **Gallipoli** campaign or Battle of **Gallipoli** or Defense of **Gallipoli**; accept Strait of **Gallipoli**; prompt on **Ottoman** Empire, Devlet-i 'Alīye-i 'Osmāniye, **Turkey**, or **Türkiye**; prompt on **Dardanelles** Strait or **Turkish Straits** or **Ottoman Straits** by asking "what nearby land area was the primary target?"; prompt on **Baby 700** or **Lone Pine** or the **Nek** until each is read; prompt on **400 Plateau**] (Keith Murdoch, the father of Rupert Murdoch, gained the notoriety at Gallipoli that allowed him to start his media empire.)

<Other History>

15. This scientist discovered structures where the stable and unstable manifolds of a fixed point intersect infinitely called homoclinic tangles. Élie Cartan ("ay-LEE car-TAWN") used differential forms to express this scientist's integral invariants, one of which requires the sum of the oriented areas of projections onto canonical planes to be preserved. After discovering an error in his own work, this scientist paid to recall his paper that had won a prize awarded by King Oscar II ("the second"). This scientist proved that a Hamiltonian system with a finite phase space volume will return arbitrarily close to its initial state infinitely many times. The state space of a dynamical system can be visualized with this scientist's namesake sections. This scientist names the group of isometries of Minkowski ("min-KOF-skee") spacetime. For 10 points, every simply connected, closed 3-manifold is homeomorphic to the 3-sphere by what French mathematician's conjecture?

ANSWER: Henri **Poincaré** ("awn-REE pwann-ka-RAY") [accept **Poincaré** conjecture; accept **Poincaré** group; accept **Poincaré** sections; accept **Poincaré** recurrence theorem; accept **Poincaré**-Cartan integral invariants]

<Physics>

16. A character in this play creates a Humphry Repton-influenced sketchbook whose pages are cut so that the "after" drawings can be superimposed over portions of the "before" drawings. A student in this play uses a metaphor involving the noise made by an "out of whack" piano played by a tone-deaf, drunk pianist, which recalls an earlier scene in which a woman complains about the noise made by a piano player in the next room. A character in this play says that "the note in the margin was a joke to make you all mad" in reference to Fermat's last theorem. The non-speaking character Gus ends this play by handing a character a drawing of the tortoise Plautus and a resident of Sidley Park. In this play, Hannah Jarvis investigates a garden hermit in the present day and Thomasina Coverly is tutored by Septimus Hodge in 1809. For 10 points, name this 1993 play by Tom Stoppard.

ANSWER: **Arcadia**

<British Literature>

17. A telltale sign of this phenomenon is the magnitude of the intensity distribution statistic “E squared minus 1” being lower than expected. The Yeats–Padilla (“pa-DEE-ya”) test detects this phenomenon’s hemihedral (“HEM-ee-HEE-dral”) form, which is an instance of its merohedral (“MEER-oh-HEE-dral”) form. When this phenomenon occurs, three-by-three matrices describing it are required to perform structure factor refinement. This phenomenon is defined by two things: a “fraction,” which quantifies the relative volumes of the different domains, and a “law,” which is a set of symmetry operators. This phenomenon can occur when the crystal lattice point group has a higher order than the crystal structure point group. Orthoclase exhibits the Carlsbad form of this phenomenon, in which one domain is rotated 180 degrees about the [001] (“0-0-1”) axis. For 10 points, name this phenomenon in which multiple crystals of the same species are joined together in different orientations.

ANSWER: crystal **twinning** [or **twinned** crystals; accept Carlsbad **twinning**; accept **twin** laws; accept **twin** fraction; accept **twin** ratio; accept **twin** scale factor; accept merohedral **twinning** or hemihedral **twinning**]

<Other Science>

18. One of these objects titles an ethical treatise in the “Imitation of God” genre written by the mystic Moses Cordovero. A woman mourns next to one of these objects in the “Judea in Captivity” motif that appears on Roman coins. Psalm 92 states that the “righteous shall flourish like” one of these objects. In the Book of Judges, Deborah gave rulings from near one of these objects named for her. “The city of” these objects is an Old Testament appellation of Jericho. The reference to *dvash* (“d’vahsh”), or honey, in Deuteronomy is thought by modern scholars to actually refer to a syrup made from this plant’s fruit. The *hadass* (“ha-DOSS”), *etrog* (“eh-TROHG”), *aravah* (“ah-rah-VAH”), and a small part of this plant make up the Four Species during Sukkot, while a larger part is often used to make the *s’chach* (“s’KHAKH”) that tops the booths. For 10 points, the triumph in Judea is symbolized by what fruit-bearing tree whose leaves are waved by Christians on the Sunday before Easter?

ANSWER: date **palm** trees [or **date** palm trees; or **Phoenix**; accept **Palm** Sunday; accept **Tamara** or **Tomar**; accept Date **Palm** of Deborah or **Tomer** Devorah; accept **lulav**; accept **palms** or **palm** fronds or **palm** branches; accept **date** honey or **date** syrup or **date** molasses; prompt on **trees** until read; prompt on **fronds**, **branches**, **leaf** or **leaves**]

<Religion>

19. An anti-tax activist in this state was censured for kicking a photographer during his swearing-in and lends his name to the tactic of using fees to bypass tax restrictions, called “de-Brucing.” In 2015, Whole Foods announced that it would stop purchasing tilapia and goat cheese produced by this state’s prison labor system. Population and inflation limits on this state’s spending and taxation were established in its 1992 Taxpayer Bill of Rights. At the end of 2021, a runaway truck driver that killed four people had his 110-year sentence reduced by this state’s governor, who also pardoned 1,351 marijuana offenses. In 2022, Camp Bow Wow CEO Heidi Ganahl challenged this state’s Jewish and openly gay governor. In this state, a trans woman in high heels kicked the perpetrator of a 2022 shooting at the gay bar Club Q. For 10 points, name this state where Governor Jared Polis succeeded John Hickenlooper.

ANSWER: **Colorado** [or **CO**]

<Current Events>

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20. This ruler took the throne based on the Treaty of the XVIII (“eighteen”) Articles, which was unfavorably revised into the Treaty of the XXIV (“twenty-four”) Articles. This ruler regained an occupied city in a siege that used the 24-inch “Monster Mortar” and was led by Baron Haxo. This ruler was called the “Nestor of Europe” for his diplomacy and familial marriage brokerages, such as that of his nephew Ferdinand II to Maria II of Portugal. This ruler accepted and then declined a throne created by the Protocol of London, letting Otto of Bavaria be chosen as king of Greece. The accession of this ruler, whose first wife was Charlotte of Wales, led to an invasion of his country in the Ten Days’ Campaign. This ruler took the throne after a nationalistic revolution that was allegedly caused by a performance of the opera *The Mute Girl of Portici* (“POR-tee-chee”) in 1830. For 10 points, what member of the House of Saxe-Coburg (“SOX-uh KOH-burg”) served as the first king of the Belgians?

ANSWER: **Leopold I** of Belgium [or **Leopold I**, King of the Belgians; or **Leopold of Saxe-Coburg-Saalfeld**;
prompt on **Leopold**] (The second sentence describes the 1832 Siege of Antwerp after the Belgian Revolution.)

<European History>

BONUSES

1. A poem set in this country asks a series of questions about a ship's figurehead, such as "Did the blue afterwards wear away?" and "Did her eyes slant in the old way?" For 10 points each:

[10m] Name this country that titles a long feminist poem divided into the sections "Palinode," "Leuké," and "Eidolon." It ends with the protagonist having Achilles's son in this country.

ANSWER: **Egypt** [or **Misr**; or Arab Republic of **Egypt**; or Jumhūrīyat **Misr** al-'Arabīyah; accept *Helen in Egypt*] (H.D. wrote *Helen in Egypt*.)

[10e] The speaker imagines Egyptian kings whose "will was not to die" in a sonnet by this poet, who sees "three long mountains and a wood" in her poem "Renescence" ("ruh-NAY-sense").

ANSWER: Edna St. Vincent **Millay** [or Nancy **Boyd**]

[10h] This poem's many allusions to ancient Egypt include a reference to the weighing of the heart. This documentary poem sequence by Muriel Rukeyser chronicles the Hawk's Nest mining disaster in Gauley Bridge, West Virginia.

ANSWER: *The **Book of the Dead***

<American Literature>

2. Answer the following about historical software malfunctions, for 10 points each.

[10h] In 1991, a Patriot defense missile system in this city failed to intercept a Scud missile that killed 28 barracked US reservists when its software stalled due to operating continuously for more than 100 hours. Saudi Aramco is headquartered in this city.

ANSWER: **Dhahran** ("dah-huh-RAHN") [or **Al-Dhahran**]

[10m] The crash of an army helicopter in this country in 1994 was first blamed on the pilots' dangerous flying in foggy conditions but was later blamed on faulty FADEC ("fay-DECK") software. Pan Am Flight 103 crashed in this country.

ANSWER: **Scotland** [or **Alba**; prompt on **United Kingdom** or **UK** or **Great Britain**; reject "England"] (Pan Am Flight 103 crashed in the Lockerbie bombing.)

[10e] An international "scare," which was ultimately largely unfounded, arose over concerns about software errors that would shut down computers when they ticked over into this year and could not properly represent the date.

ANSWER: **2000** [accept year **2000** problem; accept **Y2K** scare, **Y2K** problem, **Y2K** bug, **Y2K** glitch, or **Y2K** error; prompt on **millennium** bug]

<Other History>

3. When the Allies tried to return art stolen by the Nazis, this artist was unexpectedly exposed to acclaim when it was discovered that Hermann Göring unknowingly owned one of his paintings. For 10 points each:

[10h] Name this 20th-century Dutch artist who painted *The Woman Taken in Adultery* and *Christ Among the Doctors* in a 17th-century style.

ANSWER: Han **van Meegeren** ("hahn von MAY-khuh-run") [or Henricus Antonius **van Meegeren**; reject "Meegeren"]

[10e] To facilitate the authenticity of his forgeries, van Meegeren purchased 17th-century examples of this painting surface. This fabric was originally developed in Italy from material repurposed from Venetian sails.

ANSWER: **canvas**

[10m] Van Meegeren's forgery *Woman Drinking* is an alternate version of this Frans Hals painting of a grinning old woman in a bonnet. Van Meegeren's version excludes the owl perched on her shoulder but retains the pewter mug.

ANSWER: **Malle Babbe** ("MAH-luh BAH-beh") [or **Hille Bobbe** ("HEE-luh BAH-beh") or **Witch of Haarlem**]

<Painting & Sculpture>

4. Unlike an ideal gas, a photon gas does not conserve this quantity; instead, this quantity scales with volume and temperature cubed. For 10 points each:

[10m] Name this quantity that is conserved in the microcanonical and canonical ensembles, but fluctuates in the grand canonical ensemble.

ANSWER: **particle number** [or N ; or **number** of **particles**]

[10h] The product of the Riemann zeta function and this function appears in the expression for the particle number of a photon gas. The constant prefactor of the N -dimensional Maxwell–Boltzmann energy distribution can be written as “one over this function of N over two.”

ANSWER: **gamma** function [reject “gamma distribution”] (The Maxwell–Boltzmann distribution can be written as the gamma distribution.)

[10e] The product of the number density and energy density of a photon gas reproduces the Stefan–Boltzmann law of these objects. These idealized objects absorb all light.

ANSWER: **blackbodies** [or **blackbody**]

<Physics>

5. *Description acceptable.* As part of this event, veils were placed over a mosaic of Mary and Jesus that had previously been uncovered by plaster in 1934. For 10 points each:

[10m] Identify this 2020 event that reversed the secularization of a museum that was earlier restored by the Fossati brothers.

ANSWER: conversion of the **Hagia Sophia** back to a **mosque** [or equivalent descriptions of the **Hagia Sophia** being reverted to a **mosque**; accept creation of the **Hagia Sophia** Grand **Mosque** or creation of the **Ayasofya Camii** or equivalents; prompt on conversion of the **Hagia Sophia** or equivalents by asking “into what?”]

[10h] Whereas other symbols have been covered in carpet, this large marble square on the Hagia Sophia’s floor has not. Byzantine emperors were crowned on this artwork that contains 30 different circles.

ANSWER: **Omphalion** [prompt on **navel**; prompt on **omphalos**]

[10e] Turkey’s control over the Hagia Sophia is debated since it is one of these sites identified by UNESCO (“yoo-NESS-ko”) as being of “outstanding value to humanity.”

ANSWER: **World Heritage** Sites [or **World Heritage** Sites]

<Other Academic>

6. Michelle Girvan and Mark Newman authored a 2002 paper on community detection within these structures. For 10 points each:

[10e] Name these structures consisting of social actors and the ties that connect them.

ANSWER: social **networks**

[10h] Girvan and Newman popularized this simple social network of 34 individuals, including the rival admins “John A” and “Mr. Hi.” It is a ubiquitous toy dataset for studies in network science.

ANSWER: Zachary’s **karate club** [prompt on martial arts **club**]

[10m] As the admins, nodes 1 and 34 in Zachary’s karate club have a high degree of this broad measure of a node’s structural importance. This property’s “betweenness” type counts the number of shortest paths traversing a node.

ANSWER: node **centrality** [accept betweenness **centrality**]

<Social Science>

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7. The *dzarguchi* (“zar-GOO-chee”) tasked with supervising Chinese merchants in this town and the nearby *mǎimàichéng* (“my-my-chung”) of Altanbulag often imposed illegal taxes for their own gain. For 10 points each:
[10h] Name this town where merchants used a namesake pidgin to trade pelts and rhubarb after a 1727 successor treaty to the Treaty of Nerchinsk was signed in this town to clarify the China–Russia border.

ANSWER: **Kyakhta** (“k’YOCK-ta”) [or **Khiagt**; accept Treaty of **Kyakhta**; accept **Kyakhta** Russian–Chinese Pidgin]

[10e] The Kyakhta trade flourished under this dynasty, but was briefly suspended by its Qiánlóng (“ch’yen-lung”) Emperor in the 1790s.

ANSWER: **Qīng** (“ching”) dynasty [or Great **Qīng** or Dà **Qīng**, reject “Qín (“cheen”)”]

[10m] The Siberian Route between Russia and China was sometimes named for the quantities of this trade good transported on it. Robert Fortune was employed to steal the secrets of producing this good after the Macartney Embassy was rebuffed.

ANSWER: **tea** [or **chá**; accept **Tea** Road]

<World History>

8. Bill Evans plays a melancholy cover of this song on *The Solo Sessions* and a livelier cover of it on *Conversations with Myself*. For 10 points each:

[10h] Name this romantic song originally composed by Alex North for a 1960 movie. Yusef Lateef plays the oboe on a cover of this song for his album *Eastern Sounds*.

ANSWER: “**Love Theme**” from **Spartacus** [prompt on “**Love Theme**” by asking “from what movie?”; reject “the theme from *Spartacus*”]

[10e] Bill Evans and Ahmad Jamal both played this instrument on their respective covers of the “Love Theme” from *Spartacus*. An adaptation of *Dangerous Liaisons* was scored by another player of this instrument, Thelonious Monk.

ANSWER: **piano** [or **pianoforte**]

[10m] Lateef’s cover of the “Love Theme” was sampled by this Japanese producer on his album *Metaphorical Music*. This pioneer of lo-fi hip-hop took inspiration from jazz for his 2005 album *Modal Soul*.

ANSWER: **Nujabes** (“NOO-jah-bess”) [or **Nujabesu**; or Jun **Seba** or **Seba** Jun]

<Other Fine Arts>

9. An homage to this poem tells its author, “I swear my dead mother / embraced me. I then washed off my heart with the amniotic water of a green coconut.” For 10 points each:

[10e] Una Marson’s poem “Nostalgia” opens, “I will arise and go again to my fair Tropic” in reference to what W. B. Yeats poem set in a “small cabin... of clay and wattles made” with “nine bean-rows” and a “bee-loud glade”?

ANSWER: “The **Lake Isle of Innisfree**”

[10m] Una Marson was from this modern-day country, the birthplace of a writer who vowed in a sonnet that “Like men we’ll face the murderous, cowardly pack.”

ANSWER: **Jamaica** [or **Jumieka**] (The sonnet is Claude McKay’s “If We Must Die.”)

[10h] In her homage to “Innisfree,” this poet imagines swapping “Dark tales of Maroon warriors” and “bush comrades of Cuchulain (“coo-CULL-in”)” with Yeats. This former poet laureate of Jamaica wrote *Tamarind Season* and *I Am Becoming My Mother*.

ANSWER: Lorna **Goodison** [or Lorna Gaye **Goodison**] (The homage is “Country Sligoville.”)

<World Literature>

10. The name of these molecules borrows from a term coined by Irving Langmuir (“LANG-myoor”) to refer to any pair of compounds that have the same number of atoms and valence electrons. For 10 points each:

[10h] Give this term for molecules that structurally resemble known drugs but have been slightly engineered to improve their solubility or safety profile.

ANSWER: bioisosteres (“bio-iso-steers”) [or **isosterism**; or **biostere** or **biosterism**]

[10e] A common “classical” bioisostere replaces a hydrogen atom in a drug with this isotope, which is only one neutron heavier but is much stabler in the body.

ANSWER: **deuterium** [prompt on **D**]

[10m] More exciting bioisosteres have subbed out phenyl pharmacophores with this eight-carbon molecule. This compound is roughly the same size as benzene, but boasts the highest density and energy density of any hydrocarbon because of its 90-degree bonds.

ANSWER: **cubane** [or **pentacyclooctane**; prompt on **C8H8**]

<Chemistry>

11. Philip Johnston demonstrated this group’s importance at Camp Elliot, allowing for the recruitment of the “First 29” during World War II. For 10 points each:

[10e] Name this group that sent encrypted “Arizona” and “New Mexico” messages using their Native American tongue.

ANSWER: Navajo **code talkers** [or Diné **code talkers**; prompt on **Navajo** or **Diné**]

[10h] Many Navajos who tried to enlist in the military were dismissed due to high rates of illiteracy – a phenomenon foreshadowed in this 1928 study that deemed Indian residential schools “grossly inadequate.”

ANSWER: **Meriam** Report [or *The Problem of Indian Administration*]

[10m] Oppressive Native American policy was ameliorated by a 1934 “Indian New Deal” named for Burton K. Wheeler and a politician with this surname. A historian with this [emphasize] *first* name narrated *The People Speak*, a documentary based on his 1980 survey history of America from the “bottom-up.”

ANSWER: **Howard** [accept **Howard** Zinn; accept Wheeler–**Howard** Act; accept Edgar **Howard**] (Zinn wrote *A People’s History of the United States*.)

<American History>

12. The protagonist of this short story is an assistant to the alchemist Cornelius Agrippa. For 10 points each:

[10h] Name this 1833 story in which Winzy witnesses the slow death of his beloved wife after he takes an elixir that allows him to live forever.

ANSWER: “The **Mortal Immortal**”

[10e] “The Mortal Immortal” is by this author, whose best-known novel is about a scientist named Victor who abandons his devotion to Cornelius Agrippa when his father teaches him about electricity.

ANSWER: **Mary Shelley** [or **Mary Wollstonecraft Shelley**; accept **Mary Wollstonecraft Godwin**; prompt on **Shelley** or **Godwin**; reject “Mary Wollstonecraft”]

[10m] Shortly after his mother dies, Victor Frankenstein starts school at a university in this modern-day country, where a chemistry professor criticizes alchemists and maintains that the “elixir of life” is a “chimera.”

ANSWER: **Germany** [or **Deutschland**; or Federal Republic of **Germany**; or Bundesrepublik **Deutschland**] (He attends the University of Ingolstadt.)

<British Literature>

13. Pierre Johannis (“YO-ons”) attempted to reconcile this religion with Christianity in his book *Towards Christ Through the Vedanta*. For 10 points each:

[10e] Name this major world religion that some have attempted to syncretize with Christianity by noting the similarity of the Christian Trinity and the Trimūrti.

ANSWER: **Hinduism** [prompt on **Vedic** religion]

[10m] Christian monks in India who draw on the Vedānta in their studies belong to a Christian movement named for these places. This Sanskrit term refers to hermitages home to yogis or sannyāsi.

ANSWER: **ashrams** [or **āshrama**; accept Christian **Ashram** Movement]

[10h] Late in life, Christian Ashram movement pioneer Bede Griffith changed his name to Dayananda, referencing *daya*, one of these ethical rules from Yogic philosophy. *Ahimsā* and *satya* are the first two of the five of these “moral restraints” listed in Patañjali’s *Yoga Sutras*.

ANSWER: **yamas** [accept five **yamas** or ten **yamas**]

<Religion>

14. These phenomena were at one time speculated to be artificial because similar signals called perytons were shown to be caused by a microwave. For 10 points each:

[10h] Name these phenomena whose distribution can be analyzed by plotting them on graphs of fluence versus dispersion measure. Many of them have been observed with the CHIME (“chime”) telescope.

ANSWER: **fast radio bursts** [or **FRBs**] (Perytons are named after the mythological creature from Jorge Luis Borges’s *Book of Imaginary Beings*.)

[10m] A crude rule of thumb calculates this quantity for a fast radio burst by dividing its dispersion measure by 1,000. Surveys of this quantity, such as the one carried out by the SDSS, measure it to map the large-scale structures of galaxies.

ANSWER: **redshift** [accept cosmological **redshift** or photometric **redshift**; reject “Doppler redshift” or “Doppler shift” or “blueshift”]

[10e] The first fast radio burst was detected in a survey of these objects that were discovered by Jocelyn Bell Burnell. They are neutron stars that emit radio waves at regular periods.

ANSWER: **pulsars** [accept **pulsating radio sources**]

<Other Science>

15. This composer and conductor was an early champion of the music of the Swiss composer Joachim Raff. For 10 points each:

[10m] Name this composer who collaborated with Alfred Hitchcock to write the soundtracks for the films *North by Northwest* and *Vertigo*.

ANSWER: Bernard **Herrmann** [or Maximillian **Herman**]

[10h] Herrmann wrote his berceuse (“bair-SUZ”) *For the Fallen* for the American Symphony Orchestra and this conductor, who founded the orchestra. This conductor earlier used free bowing (“BOH-ing”) to create the “Philadelphia sound.”

ANSWER: Leopold **Stokowski** (“stoh-KOFF-skee”) [or Leopold Anthony **Stokowski**]

[10e] Herrmann’s suite from *Psycho* is often performed by ensembles made up of players of this family of instruments, who sit closest to the conductor in standard orchestral seating.

ANSWER: **strings** [accept **violin** family; accept bowed **string** family; accept **string** section]

<Classical Music>

16. Avicenna supposedly read the *Metaphysics* 40 times, but failed to understand it until he read this philosopher's commentary. For 10 points each:

[10m] Name this 10th-century Islamic philosopher known as the "Second Teacher."

ANSWER: Abu Nasr Muhammad **al-Fārābī** [or **Alpharabius**; or Abū Naṣr Muḥammad **al-Fārābī**]

[10h] Al-Fārābī argued that logic is similar to this field, except that it involves "intelligibles." A debate in the year 932 between Abu Sa'id al-Sirāfī and Abū Bishr Mattā concerned the relationship between logic and this field.

ANSWER: **grammar** [prompt on **linguistics** or **language**]

[10e] Al-Fārābī's moniker of "Second Teacher" alludes to this philosopher, who was known as the "First Teacher." Islamic logic was largely inspired by this philosopher's *Organon*.

ANSWER: **Aristotle** [or **Aristotélēs**]

<Philosophy>

17. Supposed Bosnian sympathy for this religious sect was Hungary's explanation for an invasion of the Bosnian Banate ("BAN-ate"). For 10 points each:

[10m] Name this dualistic sect founded by a priest whose adopted name means "dear to God." Alexios I Komnenos ordered a member of this sect named Basil the Physician to be burned at the stake in Constantinople.

ANSWER: **Bogomilism** [or **Bogomils**; or **Bogumilstvo**]

[10h] This ruler's namesake legal code penalized the Bogomils and built upon Matthew Blastares's ("blah-STAR-ays's") *Syntagma Canonum* ("KUH-noh-num"). The "Alemannic Guard" mercenaries led by Palman helped this ruler overthrow his father.

ANSWER: Stefan **Dušan** ("DOO-shahn") of Serbia [Stefan **Dušan** the Mighty; Stefan **Dušan** the Great, Stefan **Dušan** the Strong, or **Dušan** Silni; or **Stefan** Uroš **IV** of Serbia; accept **Stephen** in place of "Stefan"; accept **Dushan** in place of "Dušan"; prompt on **Stefan** or **Stephen**; prompt on **Uroš**]

[10e] Stefan Dušan came to power shortly after he and his father won the Battle of Velbazhd ("VELL-bahjd") over these people's Second Empire. The Byzantine emperor Basil II ended their First Empire by winning the Battle of Kleidion.

ANSWER: **Bulgars** [or **Bulgari**; accept **Bulgarians**; accept **Bulgarian Empire** or First **Bulgarian Empire** or **Balgarsko** tsarstvo; accept Second **Bulgarian Empire** or Vtoro **balgarsko** tsarstvo; accept Basil the **Bulgar**-slayer or Basil II **Bulgaroktonos**]

<European History>

18. The Swedish village of Jukkasjärvi ("YOO-kuss-YAIR-vee") hosts a hotel made completely from this material. For 10 points each:

[10e] Name this material used by the Inuit to create homes consisting of circularly upward spiraling patterns of bricks.

ANSWER: **ice** [or **snow**; accept **ICEHOTEL**; prompt on **water** or **H2O**] (The Inuit homes are igluit, or igloos.)

[10m] In 2018, the Eindhoven Institute created a 31-foot-tall sculpture at this Chinese city's annual ice festival. This capital of Hēilóngjiāng ("hay-lung-j'yahng") in Northeast China had a large Russian population due to the Chinese Eastern Railway.

ANSWER: **Harbin** ("har-BEAN") [or **Hā'ěrbīn**; or **Halbin**; accept **Harbin** Ice and Snow Festival or **Harbin** International Ice and Snow Sculpture Festival or **Hā'ěrbīn** Guójiā Bīngxuě Jié]

[10h] At the 2019 Harbin festival, Eindhoven made a 40-foot tower based on this architect's designs. This architect, who imagined specially connected canals in an "ideal city," may have designed a double-helix staircase at the Château de Chambord.

ANSWER: **Leonardo** da Vinci [or Leonardo **da Vinci**]

<Geography>

19. An antibiotic from this class is the first-line therapy for a number of zoonotic (“zoh-uh-NOT-ick”) diseases, including Lyme disease, plague, and Q fever. For 10 points each:

[10m] Name this class of bacteriostatic antibiotics. Like aminoglycosides, these drugs bind the 30S (“thirty-S”) ribosomal subunit to inhibit charged tRNAs from entering the A site, halting translation.

ANSWER: **tetracyclines** (“teh-truh-CY-cleens”) [or **tetracycline** antibiotics; prompt on **doxycycline**]

[10e] Tetracycline resistance underlies Tet-On and Tet-Off, paradigms that use tetracycline transactivators and response elements to control this process. Promoters in DNA recruit RNAPII (“R-N-A-P-two”) to initiate this process.

ANSWER: **transcription** [accept **gene expression**; accept tetracycline-controlled **transcriptional** activation]

[10h] Tet transactivators for transcriptional control generate less of this side effect than transactivators like VP16. This effect occurs when strong expression of a transactivator inhibits the expression of other genes.

ANSWER: **squelching** [or transcriptional **squelching**; or word forms of **squelch**]

<Biology>

20. A fictional manuscript by Antonius Diogenes (“dye-OJ-uh-neeZ”) with this name titles a 2021 novel by Anthony Doerr. For 10 points each:

[10e] Name this phrase now used to refer to an unrealistic realm. This phrase names the dwelling of the title creatures in Aristophanes’s (“air-ih-STOF-uh-neeZ’s”) play *The Birds*.

ANSWER: **Cloud-Cuckoo-Land** [or **Cloud-Cuckoo-Town**; or **Cuckoo-Cloud-Land**; or **Cloud-Cuckoo-Borough**; or **Nephelokokkugia**]

[10m] A character with this profession goes on an adventure in the fictional book within Doerr’s novel *Cloud Cuckoo Land*. Virgil wrote about Corydon and Thyrsis, two people with this profession who engage in a singing contest.

ANSWER: **shepherds** [or sheep **herders**; or **herdsmen**; accept **pastoralists**]

[10h] *The Birds* ends with Pisthetaerus (“piss-thuh-TAIR-uss”), who has overthrown the gods as leader of Cloud-Cuckoo-Land, marrying this companion of Zeus. You may either give her Greek name or the trait it is commonly translated as in English.

ANSWER: **Basileia** [or **Sovereignty**; or the **Sovereign** Bride]

<European Literature>