



**ACADEMIC  
COMPETITION  
FEDERATION**

**ACF NATIONALS 2022**

**PACKET 10**

**Packet by**

**The Editors (1)**

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## TOSSUPS

1. Inscriptions of this deity's name on a *pithos* ("PITH-oss") at Kuntillet Ajrud ("ah-j'ROOD") were cited by Francesca Stavrakopoulou ("STAV-rack-uh-POO-loo") in a book arguing that this deity was deliberately edited out of many narratives. In his book on "folk religion," William Dever ("DEE-ver") argues for the persistence of this deity's cult based on widespread finds of "pillar-base figurines." Somewhat confusingly, the name of this deity also denotes a type of worship-site which often consisted of a sacred grove or tree, but is usually rendered in English translation as this deity's namesake "pole." In the Bible, four hundred prophets of this deity and four hundred fifty priests of Ba'al ("bah-ahl") are brought into Israel on the orders of Ahab's wife Jezebel. Hosea ("hoh-ZAY-uh") proclaimed a theological "divorce" from this fertility goddess. For 10 points, name this goddess whom some scholars think was Jehovah's wife and is not to be confused with the similarly-named love goddess Astarte.

ANSWER: Asherah [or Ashirat or Athirat; accept Asherah pole; prompt on God's wife or YHWH's wife or Jehovah's wife before "Jehovah's wife"; reject "Ishtar" or "Astarte"]  
<Religion>

2. A novel set in this country ends with the protagonist gazing up at the aquamarine, egg-shaped mobile that hangs above his baby daughter's empty bed. In that novel set in this country, a character tearfully runs off after listening to a recording of a plane crash and gets gunned down in front of a pool hall. The murder of ex-pilot Ricardo Laverde ("lah-VER-day") becomes an obsession of law professor Antonio Yammara in that novel from this country, *The Sound of Things Falling* by Juan Gabriel Vásquez. An author from this country created a man who cannot remain a clerk at the River Company of the Caribbean because his letters are too poetic, and who hires Leona Cassiani after mistaking her for a prostitute. In that novel from here, a fall from a ladder while trying to recover a parrot kills Juvenal Urbino ("oor-BEE-noh"). For 10 points, from what country is the author of *Love in the Time of Cholera*?

ANSWER: Colombia [or Republic of Colombia; or República de Colombia] (The second author is Gabriel García Márquez.)  
<World Literature>

3. An unpopular governor of this colony was called "Big Belly" by indigenous peoples since he weighed over 400 pounds, and was recalled after he answered twenty-two settlers' reform petition by having their leader shot. It is generally thought that settlers of this colony were the first to build log cabins in the Americas, a practice they brought from the region of Savonia. This colony, created on a tract of land from Sankikan Kill to Minquas Kill, suffered from the unpopular rule of governor Johan Printz. Printz's successor, Johan Rising ("REE-sing") surrendered to the expedition by Peter Stuyvesant ("STY-vuh-sent") that conquered this colony, including the sites of present-day New Castle and Wilmington. For 10 points, what short-lived colony along the southern Delaware River named its capital Fort Christina after the queen of its home country?

ANSWER: New Sweden [or Nya Sverige ("NEW-uh S'VAR-yeh"); prompt on Delaware or Pennsylvania or New Jersey before "failed"; reject "Sweden" or "Sverige"]  
<American History>

4. This architect placed a black pyramid over the entrance gate to an estate that also features another pyramid designed by this architect's assistant. Sibyls protect the entrances of a structure this architect designed for that estate's garden called the Temple of the Four Winds, which was based on Palladio's Villa Rotonda. In an example of his "castle air" style, this architect formed a three-sided rooftop arcade by grouping all the chimneys of Kings Weston House at its center. Despite having no training, this Kit-Cat Club member designed Castle Howard. Like Christopher Wren, this man worked with Nicholas Hawksmoor, who designed the Long Library of a building from which this architect was banned due to his grandiose plans. That building by this architect honors the Duke of Marlborough's victory in the War of the Spanish Succession. For 10 points, name this English Baroque architect of Blenheim Palace.

ANSWER: Sir John **Vanbrugh**

<Other Fine Arts>

5. An algorithm for this task that relies on both a triangle self-attention module and an invariant point attention module outputs its result as an LDDT confidence score. Roland Dunbrack's rotamer library is used to benchmark algorithms at this task. Rather than the root-mean-square distance, algorithms for this task are scored in competitions like CASP ("casp") with a global distance test on each C-alpha. David Baker's lab popularized the Rosetta force field for this task, and manages a citizen science project for it. This task minimizes a funnel-shaped energy function by varying two di-hedral angles per residue. A convolutional neural net that dwarfs other algorithms at this task was released by Google's DeepMind in 2021. For 10 points, name this computational task that replaces experiments like crystallography to predict the natural configuration of a string of amino acids.

ANSWER: *de novo* **protein structure** prediction [or computationally predicting how **proteins fold** from primary sequence; accept any logical equivalents that mention **proteins** or **polypeptides** AND secondary, tertiary, or quaternary **structure** or **folding**; prompt on answers that **only** mention **proteins** or **polypeptides**; prompt on answers that **only** mention **structure** prediction or **folding** prediction by asking "Of what molecules?"]

<Chemistry>

6. Producing these machines is the main long-term goal of the Aramar Experimental Center, run by a state-owned company headquartered in Itaguai ("ee-tuh-gwuh-EE") on Madeira ("muh-DAY-ruh") island. Andy Rooney once took a tour on the *Miami*, one of these machines which was severely damaged by a fire in 2012. Air-independent propulsion is a leading alternative to the main distinguishing mechanism of these machines, which include China's *Han* class and the U.S.'s *Los Angeles* class. The *Álvaro Alberto* design of them is expected to be deployed in 2023 as part of Brazil's goal of dominating the so-called "Blue Amazon." A ninety-billion-dollar deal, under which conventional diesel counterparts to these machines would be supplied by the Naval Group, was scrapped by the AUKUS ("AW-kuss") treaty in September 2021, under which the U.S. and U.K. will supply them to Australia. For 10 points, the *Nautilus* was the first of what long-range stealthy naval vessels?

ANSWER: **nuclear submarines** [or **nuclear**-powered **submarines** or **nuclear** attack **submarines**; prompt on **submarines**; reject "ships" or "boats"]

<Current Events>

7. A 2020 paper by Valente et al. modified this theory by using the dynamic stochastic model DAISIE (“daisy”) to incorporate clado-genesis. An extension to this theory was termed the “rescue effect” by James Brown and Astrid Kodric-Brown, who tested it by measuring the turnover of arthropods on thistles. Jared Diamond’s six geometric rules for reserve design were based on the predictions of this theory, which Daniel Simberloff first experimentally tested by monitoring mangroves after fumigation. This theory was first developed to explain the apparent power-law form of the species-area relationship. In this theory, species richness is modeled on namesake geographical features as an equilibrium between colonization and extinction. For 10 points, name this ecological theory developed by Robert MacArthur and E. O. Wilson, which is often applied to life forms on archipelagos.

ANSWER: theory of **island biogeography** [or theory of **insular biogeography**; accept **MacArthur–Wilson** theory before “MacArthur”; prompt on **biogeography**]

<Biology>

8. In a play by this author, an Englishman asks a native New Yorker where she learned to speak English so well, leading her to troll him by repeatedly answering him in Portuguese. An Egyptian goddess works as a carnival attraction in Natchez in a play by this author, who wrote a play featuring the out-of-work actresses Lily, Bettina, and Dahlia, and the master of ceremonies, Lou. In a play by this author, a veteran beats his girlfriend with a high chair while their infant son is still sitting in it and then drops their children out the window when she won’t marry him. This author of *spell #7* included sections titled “no more love poems,” “dark phrases,” and “a nite with beau willie brown” in a play whose characters include “lady in yellow” and “lady in red.” For 10 points, name this Black feminist author of the choreopoem *for colored girls who have considered suicide / when the rainbow is enuf*.

ANSWER: Ntozake **Shange** (“EN-toh-zah-kee SHON-gay”)

<American Literature>

9. This ruler defended occupying a foreign port in a speech declaring that his realm had “planted its shield firmly on the ground” and promised to defend it with a “mailed fist.” Another speech by this ruler denounces China for “overturn[ing] the law of nations” and exhorts soldiers to imitate an ancient king, such that “no Chinese will dare to look cross-eyed” at his countrymen. This monarch’s naval squadron based at Kiautschou (“k’YAO-choh”) was unable to stop Sadakachi Kato’s naval bombardment during the siege of Tsingtao (“ching-DAO”), resulting in the loss of an overseas concession. This popularizer of the phrase “yellow peril” sent troops to fight the Boxer Rebellion as part of his nation’s policy of seeking a “place in the sun,” or Weltpolitik (“VELT-politic”). For 10 points, name this monarch who detailed his paranoia about Japan to his tsarist cousin in the Willy-Nicky letters prior to World War I.

ANSWER: Kaiser **Wilhelm II** (“the-second”) [prompt on Kaiser **Wilhelm**] (The second clue is the “Hun Speech.”)

<Other History>

10. The title of a painting in this series was taken from a destroyed drawing by Carl Andre, who wrote that “art excludes the unnecessary” to introduce this series in an exhibition curated by Dorothy Miller. At age 23, this series’ artist was the youngest to be featured in that MoMA show, *16 Americans*, which included four paintings from this series. Two paintings in this series, *Jill* and *Tuxedo Junction*, both feature a concentric diamond pattern. Like their artist’s later *Protractor* series, these works reflect the maxim “what you see is what you see.” The widths of the stripes that make up these works was determined by the house painter’s brush used to paint them. The lack of visual reference in these works is balanced by their evocative titles, such as *The Marriage of Reason and Squalor* and *Die Fahne Hoch!* (“dee FAH-nuh HOKE”). For 10 points, name this series of minimalist paintings by Frank Stella that have a common color.

ANSWER: **Black Paintings** [reject “Black Series”]

<Painting/Sculpture>

11. One of this culture's cities produced a namesake chronicle translated by Richmond Palmer, which says that its soil best matched soil from Medina brought by a *sahaba* named Abd ar-Rahman ibn Awf ("AB-der-RAH-muh neeb-NAOFF"). That city was among the two "Chiefs of Indigo" among this culture, as contrasted with "Chiefs of the Market." This culture is symbolized by the *arewa* ("uh-RAY-wuh") knot, which resembles an eight-pointed star and is usually colored white and green. A giant water-hoarding serpent called Sarki menaced this culture, and was slain by the exiled Abbasid prince Bayajidda ("buh-YAH-jid-duh"), who then founded its seven great cities, including Daura and Katsina. Those cities were later assimilated into Usman dan Fodio's Sokoto empire, which included an emirate based in this culture's city of Kano. For 10 points, name this historic culture of northern Nigeria which, today, is often grouped with the Fulani ("foo-LAH-nee").

ANSWER: **Hausa** ("HOW-suh") culture [or **Hausa** people; accept **Kano** before "seven great states"; prompt on **Hausa-Fulani**; reject "Fulani"]

<World History>

12. The systems that mold these people are an ideal type that, according to Eliot Freidson, is a "third logic" in the vein of markets and bureaucracy. The "service ideal" that shapes an ideology named for these people is discussed in a book on its "rise" by Magali Larson. Struggle between groups of these people to maintain a "strategic heartland monopoly" and expand jurisdictions are examined in a book titled for them by Andrew Abbott. This is the first word in the name of a class that, per a 1976 essay, is devoted to "reproduction of capitalist culture" through "mental" work; in the name given to that socially liberal class by John and Barbara Ehrenreich ("AIR-en-ryke"), it precedes "managerial." Sociologists often distinguish these people from laborers and those in other "occupations." For 10 points, identify these members of closed, credentialed vocations, such as lawyers and doctors.

ANSWER: **professionals** [or **professions**, or **professional** class, or **professionalism**; accept "The **Professionalization** of Everyone?" or **professional**-managerial class; prompt on **PMC**; prompt on **workers** or **employees** or **experts**; prompt on **doctors** before "doctors"; reject "professors"]

<Social Science>

13. After he is poisoned by his stepmother, one figure in this text orders his body to be buried atop a brazen pyramid to strike fear into future raiders. In this text, Nennius uses Julius Caesar's sword *Crocea* ("KROH-kay-uh") *Mors* while fighting against the Romans. This text describes a set of laws issued by Dunwallo Molmutius to confer sanctuary status on cities and roads. In this text, a man who was exiled for killing his father Silvius during a hunt founds the city of Trinovantum. This text opens with a dedication to Robert of Gloucester ("GLOSS-ter") and repeatedly notes the influence of Gildas. In this text, a youth advises a king to dig beneath a tower's foundations to discover a pair of sleeping dragons. This text describes the lives of Brutus of Troy and King Lear before chronicling Vortigern's war against Aurelius Ambrosius and Uther Pendragon. For 10 points, name this work by Geoffrey of Monmouth that popularized the legend of Arthur.

ANSWER: **Historia Regum Britanniae** [or *The History of the Kings of Britain*; accept **De Gestis Britonum** or **On the Deeds of the Britons**]

<Mythology/Legends>

14. An essay by this critic notes that it is easier to convince someone that Euclid or Archimedes is correct than to convince them to enjoy Virgil or Homer. This critic imagined a gathering of humorists who become ashamed to speak in each other's company and can crack jokes only after leaving the gathering, in an essay that begins, "Pleasure is very seldom found where it is sought." Will Marvel and Ned Drugget are among the fictional friends described in a series of 103 essays by this coiner of the term "metaphysical poets." He declared that "Nothing can please many, and please long, but just representations of general nature" in his *Preface to Shakespeare*. This author of the periodicals *The Idler* and *The Rambler* included biographies of his 18<sup>th</sup>-century contemporaries in *Lives of the Most Eminent English Poets*. For 10 points, name this subject of a biography by James Boswell.

ANSWER: Samuel **Johnson**

<British Literature>

15. In field-emission experiments, both this element and a lighter one in its group exhibit a surface state called the Swanson hump. Most STM tips are made of a platinum-iridium alloy, chromium, or this element. This element's superconducting sodium oxide is called a "bronze" for its metallic luster. Zirconium oxides containing this element or vanadium undergo negative thermal expansion. Adding this element and molybdenum ("muh-LIB-duh-num") to steel tools increases their toughness. In 1910, William Coolidge invented a potassium-doped ductile form of this metal for General Electric, replacing carbon and osmium in one of their consumer products. The calcium-rich ore scheelite ("SHEE-lyte") is a source of this metal, which is rarely cast into ingots since it has the highest elemental melting point. Incandescent light bulb filaments are made of, for 10 points, what element with chemical symbol W?

ANSWER: **tungsten** [or **wolfram**; prompt on W before "W"]

<Physics>

16. A paper probes this thinker's ideas using the example of a friend who saw a foot of snow in Alabama. In a paper, this thinker answered "As you wish!" to the question of whether mathematics is a part of logic. This thinker used only points and the relations of congruence and betweenness in his axiomatization of elementary geometry. A conclusion follows from premises if there is no model of the latter that is not a model of the former according to this thinker's re-definition of logical consequence. This non-American man's work was used as the basis for a new semantics in "Truth and Meaning" by Donald Davidson. He dealt with the liar paradox by assessing sentences in an object language with a meta-language, and he developed a material adequacy condition for truth called Convention T. For 10 points, a semantic theory of truth was devised by what Polish logician?

ANSWER: Alfred **Tarski** [or Alfred **Teitelbaum**]

<Philosophy>

17. A composer from this country has showcased the saxophone in such works as "Three Episodes" and "Quest." Most orchestral performances of this country's national anthem use an arrangement created by Italian conductor Bernardino Molinari. In 2021, a classical musician from this country caused a scandal when he said "In Korea they don't sing. It's not in their DNA" during a Juilliard masterclass. Four different violinists, three of them born in this country, each performed one of Vivaldi's *Four Seasons* on a 1982 live album. The ensemble that became this country's Philharmonic Orchestra was founded by Bronisław ("bro-NISS-wuff") Huberman. From 1977 to 2019, this country's Philharmonic Orchestra was led by Zubin Mehta. For 10 points, Pinchas Zukerman and Itzhak Perlman hail from what country, which has an unofficial ban on playing the music of Wagner?

ANSWER: **Israel** [or State of **Israel**; or Eretz **Yisra'el**] (The first composer is Gilad Hochman.)

<Classical Music>

18. The fully dactylic (“dack-TILL-ick”) seventh of these poems calls a figure’s heart “the ephemeral winepress / Pressing the grape for Man’s lastingest wine.” The sixth of these poems warns, “When you go to bed, don’t leave on the table / bread or milk; these attract the dead.” In a letter to translator Witold Hulewicz (“hoo-LEH-vits”), the author of these poems called them “a little rust-colored sail” as opposed to the “huge white sail canvas” of an earlier set of poems written that year. One of these poems instructs their dedicatee to “achieve the pattern of your dance; surpass / the mere arithmetic dull Nature wields” after calling her a “young woman still half-child.” The first of these opens “There rose a tree. O pure transcendence!” before describing the title figure singing. Written in tribute to Wera Knoop, for 10 points, name these poems about the “god with the lyre” by

Rainer Maria Rilke (“RYE-ner maria RIL-kuh”).

ANSWER: Sonnets to Orpheus [or *Die Sonette an Orpheus*]

<European Literature>

19. An optical observatory named for this person is scheduled to begin operation in Cerro Pachón, Chile in 2023. That telescope, formerly the Large Synoptic Survey Telescope, was renamed for this person in 2020. This scientist’s most-cited papers used data from the DTM image tube spectrograph developed by an alphabetically-earlier colleague, with whom this scientist also names an anisotropy (“ANN-eye-SAH-truh-pee”) in the recessional velocity of spiral galaxies. This colleague of Kent Ford selected the Andromeda Galaxy as the first target of a project measuring star velocities in edge-on spiral galaxies. That project of hers showed that galaxy mass grows with radius outside the galactic bulge despite an apparent lack of stars, reviving interest in a theory of Fritz Zwicky. For 10 points, name this astronomer whose flat galaxy rotation curves supported the existence of dark matter.

ANSWER: Vera Rubin [or Vera Florence Cooper Rubin; accept Rubin–Ford effect]

<Misc. Science>

20. This city was defended by fortifications at Metamaucum (“meta-MAO-kum”) during a failed siege by Charlemagne’s son Pepin, who caught a fever and died shortly after. By local tradition, this city’s first church was built by the Businiacus River after it was founded at noon on March 25, 421 C.E. Its early years are recorded in the *Chronicon Sagornini* by John the Deacon. Leo the Isaurian (“eye-ZOR-ian”) granted a title to this city’s first historically known ruler, Ursus Hypatus (“HIGH-puh-tuss”), who ruled nearly two centuries after it was settled by residents of Eraclea (“era-KLAY-uh”) who sought refuge from invading Lombards. Much later, this city gained control of the port of Zara. After acquiring several relics from Alexandria, this city adopted the symbol of the winged lion, representing its patron Saint Mark. For 10 points, name this Italian city whose early history was embellished by the Dandolo (“DAN-doh-loh”) family of doges (“DOH-jiz”).

ANSWER: Venice [or Venezia or Venesia]

<European History>

## BONUSES

1. *Description acceptable.* As souls reach this structure, each picks a “pattern of life” to be reborn into from those scattered on the ground, with some picking tyrannous lives and others the lives of animals. For 10 points each:  
 [10h] Name this structure marked by a rainbow-like column of light, which turns on a goddess’s knees. The stars, the planets, and the sun and moon rotate on this structure’s eight rims, each of which bears a singing woman.  
 ANSWER: **Spindle of Necessity** [or **Spindle of Ananke**; or **Distaff of Necessity**; or **Distaff of Ananke**; accept, but DO NOT OTHERWISE REVEAL, answers indicating the “**spindle** from the myth of **Er**” or “**spindle** from *The Republic* by Plato”; prompt on **spindle**]  
 [10m] This man reaches the Spindle of Necessity after seeing souls enter chasms in the sky and earth. He is stopped from reincarnating and awakes on his funeral pyre 12 days after dying in battle.  
 ANSWER: myth of **Er**  
 [10e] Er’s story ends this work, in which an analogy describes chained prisoners who think the shadows they see on a wall are the whole world.  
 ANSWER: Plato’s **Republic** [or Plato’s **Politeia**]  
 <Philosophy>
2. The mass deployment of this compound in warfare was facilitated by the fact that it was a by-product of the dye manufacturing processes of Bayer and other companies. For 10 points each:  
 [10e] Name this gas which was later supplanted by phosgene (“FOSS-jeen”) and mustard gas as the chemical weapon of choice in World War I, since it was easy for soldiers to detect due to its distinct yellow-green appearance.  
 ANSWER: **chlorine** gas [or **Cl**; or **dichlorine**; prompt on **Cl**]  
 [10m] The first major use of chlorine gas in World War I was against 8,000 of these French troops recruited from Algeria. Many units in the U.S. Civil War imitated these soldiers by wearing brightly colored baggy clothing.  
 ANSWER: **zouaves** (“z’WAHV”)  
 [10h] This 1915 battle near Osowiec (“oh-SOH-v’yets”) Fortress got its name from the fact that a regiment of Russians, many of whom were coughing up bits of lung after being gassed, successfully surprise-assaulted Germans nearly ten times their number.  
 ANSWER: Attack of the **Dead Men** [or Ataka **Mertvetsov** or Kampf der **toten Männer**; prompt on partial answers]  
 <European History>
3. British poets were fond of the biblical trope of clay standing in for human flesh. For 10 points each:  
 [10m] A “Reveille” (“REH-vuh-lee”) in this collection declares that “Clay lies still, but blood’s a rover.” Another poem in this collection describes the “gale of life” “which plies the saplings double” and which once blew through Uricon.  
 ANSWER: *A Shropshire Lad*  
 [10e] The speaker says he is “dumb to tell the hanging man / How of my clay is made the hangman’s lime” in “The Force That Through the Green Fuse Drives the Flower” by this Welsh author of *Under Milk Wood*.  
 ANSWER: Dylan (Marlais) **Thomas**  
 [10h] Wilfrid Owen’s “Futility” twice uses the metaphor of flesh as clay, first to mention how the sun “[w]oke once the clays of a cold star” and second to ask, “Was it for this the clay” did this two-word action. Exact words required.  
 ANSWER: **grew tall** [accept “Was it for this the clay **grew tall**?”]  
 <British Literature>



4. This kind of testing can be used to determine the number of enzymes in a metabolic pathway. For 10 points each:  
[10h] Name this type of testing that determines whether two mutations are in the same or different genes.

ANSWER: **complementation** testing [or **cis-trans** testing]

[10e] Edward Lewis developed complementation testing while working with this organism. Thomas Hunt Morgan conducted his genetic linkage experiments in this insect.

ANSWER: ***Drosophila*** (“druh-SAH-fill-uh”) *melanogaster* [or ***D. melanogaster***; or **fruit fly**; prompt on **fly**]

[10m] After complementation testing, the order of enzymes in the pathway can be determined using these mutants, which need one additional nutrient in the medium compared to the wild type.

ANSWER: **auxotrophs** (“OX-oh-troafs”) [accept word forms such as **auxotrophic** (“OX-oh-TRO-fic”)]

<Biology>

5. Leo X is thought to be one of the voyeurs watching this woman and her lover in a series of twenty-five erotic etchings from Pablo Picasso’s *347 Suite*. For 10 points each:

[10h] Name this woman, the traditional muse and mistress of an Italian painter. That painter’s portrait of this baker’s daughter shows her wearing a blue and gold armband stitched with the artist’s name.

ANSWER: La **Fornarina** [or Margarita **Luti**]

[10e] Raphael’s portrait of La Fornarina associates her with this goddess by showing her making the *pubica* gesture in front of a myrtle bush. This goddess herself stands in front of a myrtle bush in Botticelli’s *Primavera*.

ANSWER: **Venus** [reject “Aphrodite”]

[10m] Simonetta, a noblewoman from this family, is often said to be the model for Venus in Botticelli’s *The Birth of Venus*. The wasps swarming around their nest in *Venus and Mars* may be a reference to this family.

ANSWER: **Vespucci** [accept Simonetta **Vespucci**]

<Painting/Sculpture>

6. For a photon in QED (“Q-E-D”), these are the simplest diagrams whose contributions vanish according to Furry’s theorem. For 10 points each:

[10h] Give this name for one-loop Feynman diagrams with only one external leg.

ANSWER: **tadpole** diagrams

[10m] Tadpole diagrams contribute to the “vacuum” type of this quantity, which is 246 GeV (“giga-electron-volts”) for the Higgs field. For a scalar field  $\phi$ , this quantity is calculated by placing  $\phi$  between the bra and ket of a quantum state.

ANSWER: **expectation value** [or **EV**; accept vacuum **expectation value** or **VEV**]

[10e] The nonzero Higgs VEV (“V-E-V”) arises when one of these properties corresponding to the SU(2) (“S-U-two”) group is spontaneously broken. A system with this property is invariant under an operation such as reflection or rotation.

ANSWER: **symmetry** [or **symmetries**; accept spontaneous **symmetry** breaking]

<Physics>

7. Nick Brandt captured photos of animals that were literally turned into stone by a toxic lake in Tanzania named for this substance that is fed by the Ewaso Ng'iro ("ay-WAH-soh ung-EE-roh") river. For 10 points each:

[10m] Name this substance which is still mined in a *wadi* named for it in northern Egypt. Its name comes from a word of the Ancient Egyptians, who mixed it with water and lime to make building materials.

ANSWER: **natron** ("NEY-tron") [accept Lake **Natron** or Wadi el-Natrun; prompt on sodium carbonate decahydrate or sodium bicarbonate]

[10e] Lake Natron is where about 75% of the endangered "lesser" species of these birds are bred. Namibia's Etosha salt flats are also a breeding site for these birds, whose distinct color comes from eating plankton with carotenoids.

ANSWER: **flamingoes** [accept lesser **flamingo**]

[10h] Significant natron deposits are found in this African mountain range, such as in the appropriately-named Trou au Natron ("TROO oh nah-TRON") caldera and the Era Kohor caldera on its highest peak.

ANSWER: **Tibesti** Mountains (It is found in Chad, and its highest peak is Emi Koussi.)

<Geography>

8. This journalist publicly insisted that the Moscow Show Trials were legitimate, claiming that Stalin would not kill friends "unless the proofs of guilt were overwhelming." For 10 points each:

[10h] Name this journalist who won the 1932 Pulitzer Prize for reporting that contained heavy doses of Soviet propaganda, most notably denying the occurrence of the Ukrainian famine.

ANSWER: Walter **Duranty**

[10e] Duranty was the Moscow bureau chief for this newspaper, led at the time by Adolph Ochs. Ochs was succeeded by the first of four leaders of this newspaper named Arthur Sulzberger.

ANSWER: *The New York Times* [or **NYT**; prompt on Gray Lady]

[10m] This other journalist, who is one of three Americans buried in Red Square, rose to prominence as a war correspondent covering the Mexican Revolution before his later work in the Soviet Union.

ANSWER: John **Reed** (He wrote *Ten Days That Shook The World*.)

<American History>

9. In one book, this author recalls testifying on behalf of Gestapo agent "Monsieur X," who saved a Jewish family, and recalls rescuing her first husband Robert Antelme, anonymized as "Robert L.," from Dachau ("DAH-kow"). For 10 points each:

[10h] Name this writer. She wrote six short pieces about her time in the French Resistance in *La Douleur* ("doo-LURR"), which was published in English as *The War: A Memoir*.

ANSWER: Marguerite **Duras** ("d'yoo-RAHSS")

[10e] In Duras's novel *Moderato Cantabile* ("kan-TAH-bee-lay"), Anna takes her son to lessons for this musical instrument. Erika Kohut is this instrument's title *Teacher* in a novel by Elfriede Jelinek ("ell-FREE-duh YELL-ih-neck").

ANSWER: **pianoforte** [or **Klavier**]

[10m] Duras drew on her coming-of-age in *The Lover*, about a 15-year-old's affair with a much older man who is *originally* from this country, although the novel is not set here. Baron de Clappique ("klah-PEEK") helps smuggle arms to rebels in this country in a novel by Andre Malraux ("mal-ROH").

ANSWER: Republic of **China** [The Malraux novel is *Man's Fate*.]

<European Literature>

10. Answer the following about Ottaviano Petrucci, the printer of the earliest widely-circulated movable-type sheet music, for 10 points each.

[10e] Petrucci's most historically significant publications were the masses of this 16<sup>th</sup>-century Franco-Flemish composer, which include the *Missa Hercules dux Ferrariae* ("FERRARI-yay") and the *Missa Pange* ("PAN-jay") *Lingua*.

ANSWER: **Josquin des Prez** ("jo-SCAN deh PRAY") [accept either name; or **Josquin** Lebloitte]

[10h] Most of Petrucci's prints used this type of notation, which had largely replaced neumes ("n'yoomz") by around 1400. In this type of notation, noteheads were square and diamond-shaped, and the maxima and longa were common rhythmic values.

ANSWER: **mensural** notation [accept white **mensural** notation]

[10m] In the present day, Petrucci lends his name to this leading digital music library of public-domain scores. Please give either its five-word title or its five-letter initials.

ANSWER: **International Music Score Library Project** [or **IMSLP**]

<Classical Music>

11. Swami Rama described coming to understand this concept when his Himalayan guru tricked him by appearing to become trapped around a tree trunk. For 10 points each:

[10m] Give this Sanskrit concept that is sometimes translated as "magic" or "deceit." Many Hindu and Buddhist philosophies explain it as a veil that separates perception from reality.

ANSWER: **māyā** [accept the veil of **maya**]

[10e] The fundamental reality veiled by *māyā* is described by this term, contrasted with the *atman* or self. It should not be confused with the name of the creator god in the Trimurti.

ANSWER: **Brahman** [reject "Brahma" or "brahmin" or "*brāhmaṇa*"]

[10h] This text describes *moksha* ("MOAK-shuh") as the vanishing of the *māyā* of *ahamkāra* ("UH-hung-KAH-ruh"), or the delusion of "I." This text, written in the style of Valmiki ("val-MEE-kee"), is a discourse given by its namesake sage to prince Rama.

ANSWER: **Yoga Vasistha** [or **Vashista Yoga Samhita**; prompt on **Vasistha**] ("I" in Sanskrit is *aham*.)

<Religion>

12. Athenaeus writes that Philip II ("the-second") of Macedon commissioned a group of Athenians to compile a set of these statements, making it the oldest such collection mentioned in records. For 10 points each:

[10h] A Greek text called the *Philogelos* ("fee-LOH-guh-lohss") that dates to the 4th century CE is the oldest surviving collection of what statements?

ANSWER: **joke** [or word forms; or **asteios** or word forms; accept **funny** or **humorous** statements; reject "aphorisms"]

[10e] This adjective is used to describe the dry, witty statements of the Spartans, such as replying to Philip of Macedon's threat to invade their homeland with the pithy statement: "If."

ANSWER: **laconic** wit [or **laconic** humor; or **laconism**]

[10m] Mary Beard's favorite joke by this Roman is a story he tells in which Cicero is asked, "What time did Clodius die?" and replies, "Too late." Medieval and Renaissance students often read this writer's *Institutes of Oratory*.

ANSWER: **Quintilian** ("kwin-TILL-ian") [or Marcus Fabius **Quintilianus**, or **Quinctilian**]

<Ancient History>

13. The essay that introduced this model proposed a four-stage process of “production,” “circulation,” “use,” and “reproduction.” For 10 points each:

[10h] Name this model of communications proposed in the context of the “television discourse.” This model is named for two processes in which media outlets construct messages and audiences perceive them.

ANSWER: **encoding–decoding** model

[10m] This Jamaican-born British sociologist, a leading cultural studies theorist, proposed the encoding-decoding model. With Raymond Williams and E.P. Thompson, this sociologist co-founded the *New Left Review*.

ANSWER: Stuart **Hall** [or Stuart Henry McPhail **Hall**]

[10e] With “dominant,” this property names the ideological position that Hall assigned to the encoding of most major news media. Antonio Gramsci (“GRAHM-shee”) used the name of this property to denote cultural and economic leadership.

ANSWER: **hegemony** [or **egemonia**; accept **hegemonic**-dominant model]

<Social Science>

14. In this technique, liquid samples are nebulized and contacted with a “torch”; then, the resulting ions are filtered through a skimmer cone before detection. For 10 points each:

[10h] Name this form of mass spectrometry that can detect trace metals at part-per-trillion concentrations.

ANSWER: **inductively coupled plasma** mass spectrometry [or **ICP-MS**; or multicollector-**ICP-MS** or MC-**ICP-MS** or **ICP-MC-MS**]

[10e] For trace metal detection, ICP-MS is an alternative to atomic emission spectroscopy, a more sophisticated version of this qualitative assay performed in introductory chemistry labs using a Bunsen burner.

ANSWER: **flame** test

[10m] In another assay to detect trace metals, the target is first plated onto a solid surface, then stripped off it by gradually ramping up this quantity. Ferrocene (“ferro-seen”) is a common calibration standard in measurements of this quantity.

ANSWER: working electrode **potential** [or electrode **voltage**; or cell **potential**; or cell **voltage**; or electric **potential**; or redox **potential**; or reduction **potential**] (The assay is stripping voltammetry.)

<Chemistry>

15. This author of *Jamila* won the 1963 Lenin prize for his three-novella collection *Tales of the Mountains and Steppes*. For 10 points each:

[10h] Name this Soviet and post-Soviet author. He wrote of the railway operator Yedigei’s journey to bury his dead friend Kazangap in *The Day Lasts More Than a Hundred Years*.

ANSWER: Chingiz **Aitmatov**

[10e] Aitmatov is from Kyrgyzstan, whose literary work of this kind is an ultra-long oral tale about Manas. The *Ruhnama*, from Turkmenistan, is another poem of this type.

ANSWER: national **epics** [or **epic** poems]

[10m] In a side-plot in *The Day Lasts More Than a Hundred Years*, people with this occupation meet the dying pacifist society Lesnaya Grud. Kris Kelvin joins a group of people with this job in a Communist bloc novel about them.

ANSWER: **cosmonauts** [or **astronauts**; or **space** scientists; accept any answer indicating people who work in outer **space** or on **space** stations; prompt on **scientists**, **researchers**, etc.] (The other novel is Stanislaw Lem’s *Solaris*.)

<World Literature>

16. A 1955 La Scala production of this opera, conducted by Leonard Bernstein, is sometimes credited with purging the excessively flashy soprano antics that had become traditional earlier in the century. For 10 points each:

[10m] Name this opera by Vincenzo (“veen-CHEN-tso”) Bellini, whose title character, Amina (“ah-MEE-nuh”), sings the aria “*Ah! non credea mirarti*” (“ah nawn kray-DAY-uh mee-RAHR-tee”) after being rejected by Elvino, when she can’t explain why she’s in Rodolfo’s room.

ANSWER: *La somnambula* (“sohn-NAM-boo-lah”) [or *The Sleepwalker*]

[10e] That production was headlined by this tempestuous Greek *bel canto* soprano, nicknamed *La Divina*.

ANSWER: Maria **Callas** (“KAH-luss”) [or Sophie Cecilia **Kalos**]

[10h] The production was directed by this man, whose other collaborations with Callas at La Scala in the 1950s include productions of *La vestale* (“lah vess-TAHL”) and *Iphigénie en Tauride* (“ee-fee-zeh-NEE awn tau-REED”). He also directed a controversial 1966 production of *Falstaff* starring Dietrich Fischer-Dieskau (“fisher-DEESS-cow”).

ANSWER: Luchino **Visconti** [or Luchino **Visconti** di Modrone; or Count of **Lonate Pozzolo**]

<Other Fine Arts>

17. This critic's essay “Is the Rectum Straight? Identification and Identity in *The Wings of the Dove*” appears in her anthology *Tendencies*. For 10 points each:

[10m] Name this theorist who popularized the term “homosocial” in her book *Between Men*. This longtime English professor at Duke pioneered queer theory in her book *Epistemology of the Closet*.

ANSWER: Eve Kosofsky **Sedgwick** [or Eve **Kosofsky**]

[10e] Before turning to queer theory, Sedgwick analyzed conventions in this moody genre that began with Horace Walpole’s novel *The Castle of Otranto*. This genre is satirized in Jane Austen's *Northanger Abbey*.

ANSWER: **Gothic** literature

[10h] In an essay partly subtitled “You Probably Think This Essay is About You,” Sedgwick contrasted two ways of reading, one that seeks to avoid “bad surprises” through critique and one that allows for hope and pleasure. Name *both*.

ANSWER: **paranoid** AND **reparative** reading [accept answers in either order; accept word forms like **paranoia** and **repair**]

<American Literature>

18. This concept refers to the textual region of a program in which a binding is active. For 10 points each:

[10m] Identify this concept, whose “global” form is possessed by variables that can be referenced anywhere. On the other hand, variables with its “local” form can only be referenced within a function or block.

ANSWER: **scope** [accept **scoping**; accept global **scope** or local **scope**]

[10h] Languages with first-class functions may preserve lexical scope with these things. These things, which inspired the name of a Lisp dialect created by Rich Hickey, bundle a function with the environment in which it was called.

ANSWER: **closures** [or subroutine **closures**; accept object **closures**; prompt on **functors** or **function objects** by asking “What abstract things do they implement?”] (The programming language alluded to is Clojure.)

[10e] The bindings active in a particular scope are maps between these things and actual data. In Java, these things are often written in camel case, and can only contain Latin letters, underscores, digits, and dollar signs.

ANSWER: variable **names** [accept **names** of anything else, such as functions, classes, or objects; accept **identifiers**; prompt on **variables**]

<Misc. Science>

19. The rise of Buddhist nationalism among these people is credited to Anagarika (“uh-nuh-GAH-rick-uh”) Dharmapala (“durr-muh-PAH-luh”), who promoted Buddhist schools in the 19th century to counter Christian missionary schools. For 10 points each:

[10m] Name this ethnic group. Its language replaced English as the official one in one country during the tenure of Sirimavo Bandaranaike (“bun-DAH-ruh-NAH-yuh-kuh”), the world’s first female prime minister.

ANSWER: **Sinhalese** people [or **Sinhala**]

[10e] Sinhalese nationalism tied to this religious tradition, revived in Sri Lanka by missions sponsored by the Burmese ruler Anawrahta (“uh-NAW-yuh-tah”). Its core texts include the Pali Canon.

ANSWER: **Theravada** Buddhism [prompt on **Buddhism**]

[10h] Sinhalese nationalists cite this text to claim the Buddha designated Sri Lanka as “Dhammadeepa,” making the Sinhalese the preservers of *dhamma*. This Pali epic recounts eight centuries of Sri Lankan history.

ANSWER: **Mahāvamsa** (“muh-HAH-VUN-suh”) [or **Great Chronicle**; accept **Mahāvamsa: The Great Chronicle of Sri Lanka**]

<World History>

20. An Indian-American scholar, who described science advisors as policy-makers in *The Fifth Branch*, took this surname upon marrying a linguist of Proto-Indo-European verbs. For 10 points each:

[10h] Give the surname of technology scholar Sheila, who wrote *Science at the Bar*, and her historian daughter Maya, who wrote of collectors’ struggles over Eastern artifacts in the book *Edge of Empire*.

ANSWER: **Jasanoff** (“JAZZ-uh-noff”) [or Sheila **Jasanoff**; or Maya **Jasanoff**; the linguist is Jay **Jasanoff**]

[10e] The Jasanoffs all teach at this New England university, whose sometime president Larry Summers resigned after suggesting that women might have less aptitude for science.

ANSWER: **Harvard** University

[10m] In *Edge of Empire*, Maya Jasanoff describes how the strongman Giambattista (“JAM-bat-TEE-stuh”) Belzoni hauled a colossal bust of this monarch out of the desert and got it to England. That bust inspired poet Horace Smith.

ANSWER: **Ramses II** (“the-second”) [or **Ramses the Great**, or **Ozymandias**, or **Rī’amusīsū II**; prompt on **Ramses** or **Rī’a-məsī-sū**]

<Other Academic>