



**ACADEMIC
COMPETITION
FEDERATION**

ACF NATIONALS 2022

PACKET 4

Packet by

UNC A

Authors

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TOSSUPS

1. This process generates a basin of attraction spanned by the set of irrelevant operators, which may be “dangerously irrelevant” if they appear in the denominator of an observable. Leo Kadanoff proposed a form of this process in which clusters of points are averaged to produce block-spins. In this process, if the only fixed point in parameter space is the free field, then a quantum theory is “trivial.” Coupling parameters change with scale during this process as part of a flow sometimes confusingly associated with a “group,” whose description won Ken Wilson a Nobel in 1982. Despite calling this process “hocus-pocus” for its lack of rigor, Richard Feynman (“FYNE-man”) used it to integrate away the one-loop divergences in QED (“Q-E-D”). For 10 points, name this formal procedure that rescales quantities like masses and charges to remove infinite self-interactions in quantum field theory.

ANSWER: **renormalization** [accept **renormalization** group or **renormalization** group flow; accept **RG flow**;

prompt on **RG**; reject “normalization”]

<Physics>

2. A poem describes this author as a “Juno of majestic size / with cow-like udders, and with ox-like eyes.” Edmund Curll wins this author’s work in a literal pissing contest in Book II of Pope’s *The Dunciad*. After declaring her love using the pseudonym “Incognita,” the unnamed protagonist of a novel by this author unmask herself and unites with Beauplaisir (“boh-play-ZEER”). At the end of this author’s bestselling first novel, Melliora evades a wealthy Marquess and marries D’Elmont. This author was grouped with Delarivier Manley and Aphra Behn in the so-called “Fair Triumvirate of Wit.” Like her contemporary Henry Fielding, this author parodied *Pamela* with her satirical novel *The Anti-Pamela*. For 10 points, the novels *Fantomina* and *Love in Excess* were written by what prolific 18th-century female author?

ANSWER: Eliza **Haywood** [accept Elizabeth **Fowler**; prompt on **Eliza**]

<British Literature>

3. At the end of a film partly titled for one of these objects, a boy is knocked out of a tree by a rock and lies still as an ambulance is called, but eventually comes to and silently walks away. A broken mirror’s empty frame creates a box around a child with one of these objects in a Helen Levitt photo. A man with one of these objects appears blurred in an Henri Cartier-Bresson photo depicting a side street in Hyères from the top of a winding staircase. Samantha takes care of Cyril after his father abandons him in a Dardenne brothers film titled *The Kid with one of these objects*. One of these things lies fallen beside an arc of smeared blood in a photograph taken by Annie Leibovitz in Sarajevo. In a neorealist film, Antonio Ricci loses one of these things while putting up film posters on a street. For 10 points, name these objects stolen in a Vittorio de Sica film.

ANSWER: **bicycles** [or **bikes**; or **tricycles**; accept *The Kid with a Bike* or *Le gamin au vélo*; accept **Bicycle Thieves** or *Ladri di biciclette*]

<Other Fine Arts>

4. These objects name a sect founded by Basava (“BAH-suh-vuh”) whose members worship personalized examples of them that are stored in small boxes and hung from necklaces. These objects may be covered with carvings called *koshas* (“KOH-shuz”) that depict figures like Aghora and Ishana and have up to five faces. The oldest still-used example of these objects is in front of the *garbhagriha* (“GAR-bhuh-GREE-huh”) of the Gudimalla temple. Pilgrims visit twelve “radiant” examples of these objects at temples like Somnath and Kashi Vishwanath to commemorate a legend in which Brahma loses one of his heads after he lies about flying to the top of an infinite pillar of fire. These objects are often embedded in square or circular pedestals representing their feminine counterparts, which are called *yonis* (“YOH-nee-z”). For 10 points, name these symbols of Shiva that have a phallic shape.

ANSWER: **lingams** [or **lingas**; accept spatika **linga**, or **Lingayatism**, or ishta**linga**, or mukhalinga, or jyotir**linga**, or **lingam**-yoni; prompt on **murtis** of Shiva, or **idols** of Shiva, or **icons** of Shiva, or **images** of Shiva; prompt on **pillars** or **stambhas**]

<Religion>

5. A speech by this leader remarks that “work...if directed to noble ends, has no object beyond itself” for a “man who is a man” and mentions the capitulation of Nysa (“NOO-sah”) and a fortress which “Heracles himself could not take.” Another speech by this leader recalls how his father found the audience “clothed in sheepskins and pasturing small flocks” and asks “what do I have left from all these labors? Merely this purple cloak and a diadem.” This leader gave that speech, which commands “Depart!” to a group of homesick men that he made “generals and captains,” after his hypaspists (“hi-PAS-pissts”) arrested the leaders of the Opis Mutiny. He described his troops’ passage through Susa and Bactria during a speech at the Hyphasis (“HIH-fuh-siss”) river, encouraging them to continue a conquest of India. For 10 points, what king gave rousing speeches to his phalangites (“phuh-LANZH-ites”) and Companion cavalry before battles at Issus and Gaugamela (“goh-guh-MEE-lah”)?

ANSWER: **Alexander** the **Great** [or **Alexander III** or **Megas Alexandros**; prompt on **Alexander** or **Alexandros**] (The first clue refers to the Hyphasis speech.)

<Ancient History>

6. A lecture on this story summarizes its plot as “mumble, mumble, lyrical wave, mumble, lyrical wave, mumble, lyrical wave, mumble, fantastic climax, mumble, mumble.” Walking around while mentally preoccupied, this story’s protagonist gets covered with soot by a chimney sweep and then barges into a policeman who’s taking snuff. This story’s protagonist is constantly mocked by work colleagues, who ask when he’s going to marry his landlady. The protagonist commits a faux pas by saying that secretaries are unreliable in this story, which begins with the narrator saying why it is better not to specify in what department it takes place. The ghost of this story’s protagonist haunts the Important Person who rebuked him when he sought help to recover an object that was made by Petrovich the tailor. For 10 points, Akaky Akakievich is robbed of the title article of clothing in what story by Nikolai Gogol?

ANSWER: “The **Overcoat**” [or “**Shinel**”; or “The **Cloak**”] (The lecture is from Nabokov’s *Lectures on Russian Literature*.)

<European Literature>

7. The trio of this symphony’s third movement is scored for only two oboes, two bassoons, and two horns and is in the parallel major of the movement as a whole. This is the first multi-movement work by its composer in the key he would later employ in his first piano quartet and penultimate string quintet. This is by far the most famous of the four symphonies that its composer rapidly wrote just before composing his “Antretter” Serenade. This symphony opens with the syncopated repeated notes G, down to D, up to E-flat, down to F-sharp and may have been inspired by Haydn’s Symphony No. 39, which was written eight years earlier in the same minor key. This symphony’s *Sturm und Drang* (“shtoorm unt drong”) first movement opens the film version of *Amadeus*. For 10 points, name this earlier of Mozart’s only two minor-key symphonies, sometimes contrasted with the “Great” No. 40.

ANSWER: Wolfgang Amadeus **Mozart’s Symphony No. 25** in G minor, K. 183 [or “**Little G minor**” symphony; accept **K. 183**; accept just Symphony No. 25 after Mozart’s name]

<Classical Music>

8. In Philadelphian Irish English, this word undergoes scattered deletion after moving to SpecCP (“speck-CP”), so certain sentences may unusually have multiple copies of this word. James McCloskey argued for successive cyclicity by showing that this word can appear at every intermediate movement position in West Ulster English, in a phenomenon termed wh-quantifier (“W-H-quantifier”) float. This word appears with “fuck” in McCloskey’s crude test for unaccusativity. In most varieties of English, this word can follow a wh-word (“W-H-word”) to request that a set be enumerated. This word appears *twice*, once by itself and once as part of a contraction, in a phrase that can indicate a large group in Southern American English. Similarly, this word appears only once in the most common English contraction that fills the role of Middle English “ye.” For 10 points, name this word, which can be contracted with “you” to indicate a second-person plural.

ANSWER: **all** [prompt on y’all]

<Social Science>

9. David MacMillan coined the term organo-catalysis to describe the enantio-selective reaction of these compounds with aldehydes to direct a Diels–Alder reaction. Alcohols convert to these compounds in a common example of “borrowing hydrogen.” These compounds first add to formaldehyde, then condense with an active methyl-ene to form a Mannich (“MAW-nick”) base. These functional groups attack the double bond between lysine (“LYE-seen”) and PLP (“P-L-P”) in enzymes that interconvert them with keto (“KEY-toh”) groups. EDC (“E-D-C”) and NHS (“N-H-S”) activate carboxyls for attack by these weak nucleo-philes. Sodium cyano-boro-hydride reduces Schiff bases back to these compounds. Ribosomes react this functional group with carboxylic acids to form peptide bonds. For 10 points, name these compounds that contain a saturated nitrogen atom bonded to carbon, usually as a basic NH₂ (“N-H-2”) group.

ANSWER: **amines** [or **amino** group; prompt on amino acids by asking, “Which functional group does this specific chemistry?”; reject “imine”; reject “enamine”; reject “amide”]

<Chemistry>

10. People in this country tried to communicate with the dead, or summon a spirit named “Big Ears,” by wrapping themselves in the hides of slaughtered oxen or bulls and lying near a waterfall. It’s not Germany, but a treatise from this country begins with a preface denouncing the apologists Cornelius Agrippa and Johan Weyer (“VY-ur”) and features explanations of “strange events” by the philosopher Epistemon. A ruler of this country was caught in a storm while returning from Denmark in 1590, leading to a series of trials in which confessions were extracted at the Old Tollbooth. That ruler, who led [emphasize] *only* this country at the time, wrote a treatise on black magic titled *Daemonologie* (“demonology”) and married Anne of Denmark. For 10 points, name this country where the Auld (“old”) Kirk Green hosted the North Berwick witch trials during the reign of James VI (“the sixth”) of the Stuarts.

ANSWER: **Scotland** [or **Alba**; accept Kingdom of **Scotland**; prompt on United Kingdom or Great Britain] (The first clue refers to the practice of *taghairm*.)

<European History>

11. Barry Eichengreen analyzed the U.S.'s lack of "cooperative standards" supporting this policy internationally during the 1920s and 30s in a book whose title likens it to "fetters." This policy was restored by a compromise bill that addressed the issue of "shin plasters" and was engineered by George Edmunds. Historians generally regard the 1870s through 1914 as the "classical" period of this policy, whose end was challenged in an article asking "What Has the Government Done?" by Murray Rothbard. The last vestige of this policy in the U.S. was ended with a 1971 directive to John Connally, which prompted the "Nixon shock" and disrupted Bretton-Woods. A speech named for opposing this policy warned to not "press down upon the brow of labor this crown of thorns." For 10 points, name this policy that William Jennings Bryan said "mankind" should not be "crucified" by.

ANSWER: the **gold standard** [accept answers which refer to the **gold standard**, or **currency** backed by **gold**, or the ability to **redeem** paper money / currency / bank notes as **gold**; prompt on **Cross of Gold**; prompt on **specie payment** or **specie redemption** or **gold money** or **ending bimetallism**; reject "gold coins"] (Eichengreen's book is titled *Gold Fetters*; the bill in the second clue became the Specie Payment Resumption Act.)

<American History>

12. A set of thinkers at this university is the subject of Edith Sylla's doctoral thesis. The bold claim that "No term signifies anything naturally" opens a treatise on signification written at this school. The sentence "Socrates is infinitely whiter than Plato begins to be white" was among 48 puzzling statements listed by a logician at this university. The most notable standalone treatise on *insolubilia* ("een-soh-loo-BEE-lee-ah"), a type of liar paradox, was written at this university by a cleric. A group that included William Heytesbury and Thomas Bradwardine is now called this school's "Calculators." A 20th-century thinker based at this university imagined a visitor who sees its buildings but still asks where this university is, an example of what he called a "category mistake." For 10 points, at what university did ordinary language philosophy develop around Gilbert Ryle?

ANSWER: **Oxford** University [accept **Oxford** Calculators; prompt on **Merton College** by asking "What institution is that a part of?"] (The treatise on signification was by John Dumbleton. The 48 statements are the *sophismata* of Richard Kilvington.)

<Philosophy>

13. In a play by this author, a policeman demonstrates power to a colleague by getting a vendor to agree that the melon he is holding is actually a pawpaw. In that play by this author, Florence Nightingale, Al Jolson, and Horatio Nelson are among those who are sentenced to hang in a jungle, for the crime of being white. A character thinks that spiders with white eggs are omens of death in that play by this author, whose protagonist heals a man's snakebite by pressing a coal into the man's palm to sweat out the venom. In that play by this man, Moustique ("moo-STEEL") is beaten to death by an angry mob for pretending to be a healer, and the criminals Souris ("soo-REE") and Tigre ("TEEG") are sprung from Corporal Lestrade's jail by Makak. That play is his *Dream on Monkey Mountain*. For 10 points, the fishermen Hector and Achille appear in the *Iliad*-inspired epic poem *Omeros* by what Saint Lucian poet?

ANSWER: Derek **Walcott**

<World Literature>

14. These objects title an essay that presents a lens on contemporary art using the relationship between Diego Velasquez and Juan de Pareja (“pah-RAY-hah”), which opens a 2021 collection by Jesse McCarthy. Another essay titled for these objects remarks that “survival is not an academic skill” for people born in the “crucible of indifference,” such as those whose “daughters line 42nd street.” That essay titled for these objects excoriates the limited perspectives on the “personal and political” found at the conference where it was delivered, which commemorated the 30th anniversary of *The Second Sex*. An argument that poor women, Third World women, and others can only “temporarily beat” their opponent “at his own game” with these objects is found in an essay from the collection *Sister Outsider*. For 10 points, Audre Lorde said that what objects “will never dismantle the master’s house?”

ANSWER: the **master’s tools** [accept “The **Master’s Tools** Will Never Dismantle the Master’s House”; prompt on **tools**] (The essay from the first sentence is “The Master’s Tools” from McCarthy’s book *Who Will Pay Reparations on My Soul?*)

<Other Academic>

15. Each intermediate example of these structures can be produced in one step under the conditions of Lüroth’s (“LOO-roht’s”) theorem. In Artin–Schreier theory, the roots of “ x -to-the- p minus x minus alpha” are used to generate a normal and separable one of these structures from a simpler one of them. Valuations equip these structures with a notion of size analogous to a metric. The fundamental theorem of Galois (“gal-wah”) theory relates subgroups of a Galois group to extensions of a “base” one of these structures. The smallest one of these structures over which a polynomial can be fully factored is termed “splitting.” Vector spaces allow scalar multiplication by members of a selected one of these structures, such as the rationals or reals. For 10 points, name these algebraic structures that are less general than rings, since their addition and multiplication operations are both commutative.

ANSWER: **fields** [accept intermediate **fields** or Galois **fields** or **field** extensions or extension **fields**; accept finite **fields** before “rationals”; prompt on **extensions**; prompt on **rings** before “rings”]

<Misc. Science>

16. An artist with this surname collaborated with Martyn Atkins on a work featuring the Appiani family tomb in Genoa. *South Face*, *Front Face*, and *North Face* make up a monumental 9-foot-by-21-foot triptych by an artist with this surname, in which a woman in white lingerie stares down at the viewer from three different angles. That work, *Strategy*, appears on the cover of Manic Street Preachers’ album *The Holy Bible*. A Luce Irigaray (“LOOSE ee-ree-gah-RAY”) quote is mirrored over a large nude self-portrait by an artist with this surname, in which she is perched at the top of a post. An artist with this surname painted that work, *Propped*, as part of her lifelong study of female flesh. A graphic designer with this surname used a stacked plot of pulsar signals for an image resembling white mountains on a stark black background. For 10 points, give this surname of Peter, who created the cover of Joy Division’s *Unknown Pleasures*, and Jenny, a British painter.

ANSWER: **Saville** [accept Peter **Saville** or Jenny **Saville**]

<Painting/Sculpture>

17. This city’s Bebedores (“beh-beh-DOR-ace”) mural depicts the goddess Mayahuel (“mah-YAH-wel”) presiding over dozens of drunken revelers and is found in its Courtyard of the Altars. The Goddess of the Nine Rains was worshiped at a site in this city and supposedly ordered a lightning strike that burned her image into its Church of Our Lady of Remedies. Claiming that it was a uniquely evil site of paganism, the Tlaxcalans (“tlash-KAH-lans”) convinced the Spanish to gather this city’s nobles in a courtyard, block the exits, and massacre them. This still-inhabited city, found in the metropolitan district of Puebla, contains a building which was said to have been built by the Quinametzin (“kee-nah-MET-zeen”) giants. That 450-meter-wide building in this city has the Nahuatl (“NAH-watl”) name Tlachihualtepetl (“tlah-chee-wal-TEH-petl”) which translates as “mountain made by hand.” For 10 points, name this ancient Mexican city whose Great Pyramid is, by volume, the largest pyramid in the world.

ANSWER: **Cholula** [prompt on **Puebla** before “Puebla”]

<World History>

18. Some critics have suggested that a sonnet by this author that asks “what thing is this / That hastening headlong to a dusty end / Dare turn upon me these proud eyes of bliss?” might be narrated by Mercury because it mentions “My wingèd helmet and my wingèd heel.” Another sonnet by this author declares that love cannot “clean the blood” or “fill the thickened lung with breath.” This poet wrote a sequence of 52 sonnets, one for each week in a year-long affair, in her collection *Fatal Interview*. This poet wrote a sonnet in which a tree doesn’t know “what birds have vanished one by one” but recognizes that its boughs are “more silent than before” and a sonnet that declares, “let geese / Gabble and hiss.” For 10 points, name this American poet whose sonnets include “What lips my lips have kissed, and where, and why” and “Euclid alone has looked on Beauty bare.”

ANSWER: Edna St. Vincent **Millay**

<American Literature>

19. Long-term studies of these ecosystems from Heron Island provided some of the first evidence for the intermediate disturbance hypothesis. The dynamics of tropical rainforests and these other ecosystems motivated Hubbell to develop the neutral theory of biogeography. Degree heating weeks from NOAA (“noah”) satellite products are often used to quantify these ecosystems’ exposure to thermal stress. Observations of these ecosystems at sites like Moorea have shown large declines in genera (“JEN-uh-ruh”) like *Acropora* (“ack-ruh-POR-uh”). Along with a certain type of forests, these ecosystems are the sites of most documented inverted trophic pyramids. Global warming has increased the expulsion of zooxanthellae (“zoh-uh-zan-THELL-ee”) from these marine ecosystems’ foundation species. For 10 points, name these diverse ecosystems based around the calcium carbonate skeletons of their namesake animals.

ANSWER: **coral reefs** [prompt on partial answer; prompt on answers like atolls or lagoons by asking “what sort of ecosystem does that exemplify?”]

<Biology>

20. In 2019, this country appointed Canadian investor Robert Friedland as CEO of a state-owned mining company created to excavate Mount Nimba. A ban on female genital mutilation was included in this country’s 2020 constitutional referendum, which sparked clashes between animists, Christians, and Muslims in its southeast. A colonel of this country’s Group of Special Forces quoted Ghana’s Jerry Rawlings in a September 2021 speech declaring “it is up to the army to give the people their freedom.” Rio Tinto has sought to expedite iron ore mining at Simandou (“see-mahn-doo”) through talks with this country’s interim president, Mamady Doumbouya (“MAH-mah-dee doom-BOO-yah”), who led a 2021 coup that ousted Alpha Condé (“CON-day”). This major bauxite exporter has refused to enforce ECOWAS (“ECHO-woss”) sanctions along its northeastern border with Mali. For 10 points, name this West African country whose capital is Conakry (“CON-uh-cree”).

ANSWER: Republic of **Guinea** [or République de **Guinée**; or **Guinea**-Conakry; reject “Guinea-Bissau”]

<Current Events>

BONUSES

1. As part of this initiative, the Hatt-ı Hümayun (“HAHT-tuh h’yoo-mah-YOON”) of 1856 promised religious equality in government appointments and actions. For 10 points each:

[10m] Name this long-term program which began with the Hatt-ı Şerif (“HATT-tuh sheh-REEF”) of Gülhane (“g’yool-hah-NAY”) issued in 1839. It created new administrative units called vilayets (“vill-uh-YETS”).

ANSWER: **Tanzimat** (“tahn-zee-MAHT”) reforms [prompt on reorganization]

[10e] As long as they paid this tax on religious minorities, non-Muslims in the Ottoman Empire were exempt from military conscription under the Tanzimat reforms.

ANSWER: **jizya** (“JIZ-yuh”)

[10h] A decade after the Tanzimat reforms, Ahmed Cevdet (“JEV-det”) Pasha began compiling this first modern Turkish civil code based on Islamic law.

ANSWER: **Mecelle** (“meh-JELL-luh”) [or **Mecelle-’i** Ahkām-ı ‘Adliye or **Majallah** el-Ahkam-i-Adliya; prompt on Ottoman Civil Code]

<World History>

2. This philosopher’s namesake “identification problem” arises from the fact that the natural numbers can be reduced to an infinite number of pure sets. For 10 points each:

[10h] Name this Princeton philosopher of “What Numbers Could Not Be,” which argues that numbers form an abstract structure defined by recursive progression. Elisabeth Lloyd accused him of sexual harassment in 2017.

ANSWER: Paul **Benacerraf** (“bih-NAS-uh-ruff”)

[10m] Benacerraf’s identification problem is an argument against *this* realist position, which holds that mathematical objects are abstract and spatiotemporally independent.

ANSWER: mathematical **Platonism**

[10e] Benacerraf co-edited a popular philosophy of mathematics anthology with this Harvard philosopher, his doctoral advisor. He created the “Twin Earth” thought experiment and co-names an indispensability argument with Quine.

ANSWER: Hilary (Whitehall) **Putnam**

<Philosophy>

3. Thomas Edison was among the hundreds of people who searched the skies above Wyoming for this object during the Great Eclipse of 1878. For 10 points each:

[10m] Name this hypothetical planet proposed to explain discrepancies in the orbit of Mercury. Named for a Roman god, it was allegedly spotted by amateur astronomer Edmond Lescarbault (“luh-scar-BOH”).

ANSWER: **Vulcan**

[10h] This French astronomer proposed Vulcan’s existence in the 1840s. In the same decade, he precisely calculated the coordinates at which Johann Gottfried Galle (“GAH-luh”) discovered the planet Neptune.

ANSWER: Urbain (Jean Joseph) **Le Verrier**

[10e] Support for Vulcan’s existence diminished with the advent of this theory, which explained the perihelion (“pair-ee-HELL-ee-un”) precession of Mercury by attributing it to the curvature of spacetime around the Sun.

ANSWER: **general relativity** [prompt on GR; prompt on relativity; reject “special relativity” and “SR”]

<Misc. Science>

4. Answer the following about 19th-century France's chief teacher of sacred music, Louis Niedermeyer, for 10 points each.

[10e] Niedermeyer was a leading scholar of this genre of monophonic sacred vocal music. A subtype of this genre is named for a 6th-century pope.

ANSWER: **chant** [or plain**chant**; or **plainsong**; accept Gregorian **chant**]

[10h] Bruce Adolphe has suggested that Gabriel Fauré's ("foh-RAY's") time studying chant with Niedermeyer can be heard in the uneven rhythms in the strings, played against offbeat piano chords, that open this C-minor piece by Fauré.

ANSWER: **Piano Quartet No. 1** in C minor, Op. 15 [prompt on **piano quartet**; prompt on **quartet**]

[10m] After Niedermeyer's death in 1861, this close friend quoted one of Niedermeyer's masses in the "Christe eleison" movement of his own *Petite messe solennelle* ("puh-TEET mess soh-luh-NEL"). This composer used the term "sins of old age" for the salon pieces he wrote at the end of his life.

ANSWER: Gioachino (Antonio) **Rossini**

<Classical Music>

5. After treason charges against this author were dropped due to his supposed mental impairment, this author wrote the book *On Overgrown Paths* to prove that his faculties were intact. For 10 points each:

[10m] Name this author whose most famous novel depicts a starving vagrant wandering the streets of Kristiania.

ANSWER: Knut **Hamsun** [or Knud **Pedersen**] (That novel is *Hunger*.)

[10h] One of the writings that led to Hamsun's treason trial was this very short work, published in *Aftenposten* ("OFF-tin-poh-stin"), which describes its subject as "a warrior for humankind and a preacher of the gospel of justice for all nations." A description is acceptable.

ANSWER: Hamsun's **obituary** for **Hitler** [accept **death notice** for "obituary"; prompt on partial answer]

[10e] Another Norwegian author, Karl Ove Knausgaard ("call OO-vuh kuh-NOWSS-gor"), included an over 400-page essay about Hitler in this six-novel cycle, which shares its title with an autobiographical work Hitler wrote while imprisoned.

ANSWER: **My Struggle** [accept **Min kamp**; accept **Mein Kampf**]

<European Literature>

6. The "reduced form" of economic models named for this adjective can be found by solving for their endogenous variables in terms of exogenous variables and unobservables. For 10 points each:

[10h] Give this adjective. In economics, it names models that, broadly speaking, seek to identify deep parameters, underlying mechanisms, and policy counterfactuals.

ANSWER: **structural** [accept **structural** models or **structural** estimation; reject "superstructure"]

[10m] Structural models often employ path analysis and this other technique, which explains variation among a large set of observed variables using a smaller set of latent ones. It's similar to principal component analysis.

ANSWER: **factor** analysis [accept any answer containing the word **factor**; reject "hidden variables"]

[10e] Outside of economics, structural modeling and factor analysis are often applied to surveys of this psychological trait. For example, the "Big Five" model of this trait uses five factors.

ANSWER: **personality**

<Social Science>

7. For 10 points each, answer the following about historiographic reactions to COVID-19:

[10e] COVID-19 contact tracing has been compared to contact tracing of this disease during a 1960s epidemic in the U.S. This so-called “French disease” may have been brought to Europe during the Columbian exchange.

ANSWER: **syphilis** [prompt on *Treponema pallidum*]

[10m] Many historians have used the title of this historian’s book *Strange Defeat* to describe the failure of Western governments during COVID-19. This Jewish member of the Annales school was executed for activities in the French Resistance.

ANSWER: Marc **Bloch**

[10h] This Columbia University historian’s 2021 book *Shutdown* examines the economic impact of COVID-19. This writer’s economic history of Nazi Germany is titled *The Wages of Destruction*.

ANSWER: Adam **Tooze**

<Other History>

8. Golden letter A’s that symbolize the *Ave Maria* prayer hang from the branches of a plant that resembles this object in Petrus Christus’s *Madonna of the Dry Tree*. For 10 points each:

[10h] Name this object that is central to a Hieronymus Bosch painting that includes a soldier wearing a spiked collar. In that work, this object is held in the gauntlet of a man with a hunting arrow tucked into his green headdress.

ANSWER: **crown of thorns** [prompt on **crown**]

[10e] This Italian painter included a bust of Tiberius in his version of *The Crowning with Thorns*. A god leaps out of a chariot pulled by cheetahs in this artist’s *Bacchus and Ariadne*.

ANSWER: **Titian** [or **Tiziano** Vecellio or **Tiziano** Vecelli]

[10m] Sainte-Chapelle (“SANT shah-PELL”), which was built to house the crown of thorns, appears in a calendar miniature depicting the month of June in this book of illuminated manuscripts by the Limbourg brothers.

ANSWER: **Très Riches Heures** (“tray reesh UR”) *du Duc de Berry* [or *The Very Rich Hours of the Duke of Berry*]

<Painting/Sculpture>

9. This adjective describes DFT (“D-F-T”) functionals that weight the sum of the local density approximation with an exact Hartree–Fock exchange term. For 10 points each:

[10e] Name this adjective. It also describes combinations of atomic orbitals of different shapes, such as sp² (“S-P-two”).

ANSWER: **hybrid** [or **hybridized**]

[10m] Hybrid functionals reduce the mean-field energy predicted by Hartree-Fock by accounting for this effect, the reduced repulsion between individual electrons because their wavefunctions are coupled, so they “avoid” each other.

ANSWER: electron-electron **correlation** [or exchange-**correlation** energy]

[10h] Modern DFT calculations usually default to this hybrid functional, despite its regularly poor performance at predicting bond energies. Its name is an abbreviation containing a letter, a number, and three more letters; you may provide those last three letters in any order.

ANSWER: **B3LYP** (“B-3-L-Y-P” or “B-3-lip”) [or **Becke, 3-parameter, Lee–Yang–Parr**; accept **B3YLP**, **B3YPL**, **B3LPY**, **B3PYL**, or **B3PLY**]

<Chemistry>

10. This author's namesake group included Louis MacNeice and Cecil Day-Lewis. For 10 points each:

[10e] Name this English author who wrote, "About suffering, they were never wrong, the Old Masters" in his poem "Musée des Beaux Arts" ("moo-ZAY day boh-ZAR").

ANSWER: W(ystan) H(ugh) **Auden** [accept the **Auden** Group; accept the **Auden** Generation]

[10m] In 1936, Auden traveled through this country with MacNeice. During that trip, they produced a collection titled *Letters from* this country, which includes an Auden poem titled "Journey to" this country that describes the "great plains [...] for ever where cold creatures are hunted."

ANSWER: **Iceland**

[10h] In this short story by a different author, Fiona recalls reading *Letters from Iceland* to try to connect to her Icelandic heritage; later in this story, her husband brings her another book about Iceland after her battle with Alzheimer's makes her forget that she is married.

ANSWER: "The **Bear Came Over the Mountain**" (by Alice Munro)

<British Literature>

11. Pare Lorentz described the origins of the Dust Bowl in a 1936 documentary titled for an example of these devices "that broke the plains." For 10 points each:

[10e] Name these devices. A 19th-century maxim held that "rain follows" these devices, meaning that settlement in dry regions would cause them to become more fertile over time.

ANSWER: **plow** [accept *The **Plow** that Broke the Plains* or "rain follows the **plow**"]

[10h] The "rain follows the plow" maxim promoted settlement west of this line, which demarcates the humid east and semi-arid west of the U.S. Roughly speaking, this straight line goes through the middle of the Dakotas.

ANSWER: **100th meridian** west [or **100 longitude** west or **100 degrees longitude** west]

[10m] This second director of the USGS promoted the hundredth meridian as a demarcating line. This geologist explored much of the Colorado River and made the first government-sponsored journey through the Grand Canyon.

ANSWER: John Wesley **Powell**

<American History>

12. This substance contains 5 namesake "major" proteins, and it is secreted from glands in the hypo-pharynx. For 10 points each:

[10m] Name this substance that contains 3,10-di-hydroxy-do-deca-noic acid. This substance is fed in large quantities to larvae.

ANSWER: **royal jelly**

[10e] Royal jelly is fed to queens of this species. Their behaviors, including the waggle dance, were studied by Karl Frisch, and their Africanized "killer" species are particularly aggressive.

ANSWER: **bees** [or ***Apis mellifera***; or ***A. mellifera*** or **honeybee**]

[10h] Foraging bees show enlargement of this brain structure, which is vital to olfactory learning. This structure contains Kenyon cells, whose dendrites localize to this structure's calyces ("KAY-luh-sees").

ANSWER: **mushroom body** [or **mushroom bodies**]

<Biology>

13. One member of this family, James Russell, was the first editor of *The Atlantic Monthly* and satirized Poe and Longfellow in *A Fable for Critics*. For 10 points each:

[10e] Name this New England literary family that includes the author of "For the Union Dead," Robert.

ANSWER: **Lowell** [accept James Russell **Lowell**; accept Robert **Lowell**]

[10h] James Russell Lowell's successor as editor was James T. Fields, whose widow spent 38 years living with this author, who was possibly her lover, in one of the more celebrated "Boston marriages" of the 19th-century. This author was the dedicatee of Willa Cather's *O, Pioneers!*

ANSWER: Sarah Orne **Jewett**

[10m] Fields's successor as editor was William Dean Howells, who wrote this novel in which Basil March and Fulkerson start a magazine called *Every Other Week*.

ANSWER: *A **Hazard of New Fortunes***

<American Literature>

14. For 10 points each, answer the following about sayings from *The Imitation of Christ*, a Catholic devotional book:

[10e] Many of the sayings reflect a theme of impermanence described by this word, as do medieval and Renaissance paintings of skulls. The Book of Ecclesiastes ("eck-LEE-zee-ASS-teez") begins by declaring that "all is" this word.

ANSWER: **vanity** [or *vanitas* or *hevel*]

[10m] *The Imitation of Christ* contains a version of a phrase spoken during papal coronations, which describes the fleeting nature of this quality; in English, the phrase is often rendered as "thus passes" this quality.

ANSWER: the **glory** of the **world** [or **gloria mundi**; accept answers that contain both **glory** and **world**, or **glory** and **Earth**; accept "Thus passes the **glory** of the **world**" or "Sic transit **gloria mundi**"]

[10h] This other phrase from the book describes God's sovereignty over all human affairs and names a supposedly-haunted painting of John Franklin's expedition. You may give either the common four-word English or five-word Latin version of the phrase, both of which rhyme.

ANSWER: "**Man proposes, God disposes**" [or "**Homo proponit, sed Deus disponit**"]

<Religion>

15. Answer the following about urban areas on Florida's western coast, for 10 points each.

[10m] These fish, which grow up to 8 feet long, name a heavily Greek-American town in Pinellas ("pih-NELL-uss") County called their "Springs." Since these silvery fish aren't eaten, sport fishing for them in Florida is catch-and-release only.

ANSWER: Atlantic **tarpon** [accept **Tarpon** Springs; accept **Megalops** atlanticus]

[10e] Further south, the Sunshine Skyway Bridge crosses this inlet. In 2021, rents skyrocketed in this body of water's namesake city and nearby St. Petersburg.

ANSWER: **Tampa** Bay

[10h] Still further south, this booming planned city of over 194,000 people is across the Caloosahatchee ("kuh-LOO-suh-HATCH-ee") river from Fort Myers. Many of its homes are built along the most extensive artificial canal system of any city in the world.

ANSWER: **Cape Coral**, Florida

<Geography>

16. This demonstration was planned by a radical group called the Redstockings. For 10 points each:

[10m] Identify this extremely successful October 24, 1975 demonstration that about 45% of Iceland's working age population participated in. It quickly prompted the passage of new laws regulating pay.

ANSWER: **women's strike** [or **Women's Day Off**; or **Long Friday**, or **Women's Friday**, or **Kvennafrídagurinn**; accept answers indicating a **strike** by **women**]

[10e] This Icelandic body, which dates back to the 10th century, passed those laws to address gender pay gaps. Once led by a "law-speaker," it now has a woman prime minister.

ANSWER: **Althingi** [or **Allthing**]

[10h] The strike led this theater director, divorced single mother, and breast cancer survivor to run for President of Iceland; she served as the first elected woman head of state from 1980 to 1996. Please give her first name.

ANSWER: **Vigdís** Finnbogadóttir

<European History>

17. Gwydion ("GWID-yawn") disguised this woman's son as a shoemaker's apprentice to trick her into giving him a name, which she did by commenting on his aim after seeing him strike a wren with a stone. For 10 points each:

[10h] Name this mother of Llew Llaw Gyffes ("LUH LAH-oo GUH-fess"), who was humiliated after failing a virginity test set by her uncle Math fab Mathonwy ("MATH VAHB mah-THAHN-wih"). Her initial refusal to give Llew a name was the first of three *tyngedau* ("TING-ed-eye") curses that she placed on him.

ANSWER: **Arianrhod** ("ar-YAWN-rod")

[10m] Because Arianrhod cursed Llew not to have a human wife, Gwydion and Math made Blodeuwedd ("blah-DUH-weth") using these objects. Though named for these objects, Blodeuwedd was eventually turned into an owl.

ANSWER: **flowers** [or **blossoms**; accept **flowers** of the **oak**, **broom**, or **meadowsweet**, but reject any other flowers]

[10e] The story of Arianrhod and Llew Llaw Gyffes appears in this collection of Welsh mythological texts. The first modern publication of this collection is credited to Lady Charlotte Guest.

ANSWER: **Mabinogion** ("mah-bih-NOG-yawn") [prompt on the Four Branches of the **Mabinogi**]

<Mythology/Legends>

18. Answer the following about the label Acid Jazz Records, for 10 points each.

[10e] A primary influence on acid jazz was this broad, African-American genre of strongly rhythmic dance music with heavy bass exemplified by James Brown's "Cold Sweat." Herbie Hancock's Headhunters fuses jazz with this genre.

ANSWER: **funk** music

[10h] One of Acid Jazz Records's earliest releases was a funky cover by the James Taylor Quartet of a track from this Herbie Hancock soundtrack, which includes a rewrite of "The Train Kept A-Rollin'" by The Yardbirds called "Stroll On."

ANSWER: soundtrack to **Blow-Up** [or film score or movie score to **Blow-Up**]

[10m] In the 1990s, Acid Jazz Records co-founder Eddie Piller promoted acid jazz in a London club of this name. A record label of this name produced Hancock's *Maiden Voyage*, Art Blakey's *Moanin'*, and Wayne Shorter's *Speak No Evil*.

ANSWER: **Blue Note** [accept **Blue Note** Records]

<Other Fine Arts>

19. When a priestess of Priapus (“PRY-uh-pus”) in this work says she’ll take no daily ration “*post asellum*” (“ah-SELL-oom”), it’s unclear if that means she plans to eat a fish, eat a donkey, or have “a little ass” in a more sexual sense. For 10 points each:

[10e] Name this ribald Latin prose work attributed to Petronius. Its surviving fragments include Trimalchio’s feast.

ANSWER: Satyricon *liber* [or Satyrical]

[10h] The aforementioned priestess is this character, who wields a whalebone wand in a nightmarish orgy scene after her handmaid stabs a man’s cheek with a hairpin. She cheers on the wedding of Pannychis (“pah-noo-KEESE”), a seven-year-old girl.

ANSWER: Quartilla (*Asellum*, the accusative case of *asellus*, can mean “little donkey” or a type of fish.)

[10m] In the last fragment of the *Satyricon*, Eumolpus (“yoo-MALL-pus”) cites historical cases of this frowned-upon deed. In Book I of Ovid’s *Metamorphoses*, Jupiter decides to flood the world while outraged at king Lycaon (“lye-KAY-on”) doing this.

ANSWER: cannibalism [or anthropophagy; accept any answer indicating serving cooked human to guests; accept any answer indicating eating people, human beings, human corpses, one’s children, etc.; prompt on eating]
<World Literature>

20. This phenomenon corresponds to a transmission probability of 1 in the Landauer–Büttiker formalism. For 10 points each:

[10m] Name this type of electron transport observed in mesoscopic systems. It is characterized by a mean free path that is much longer than the scale of the medium through which particles travel.

ANSWER: ballistic transport [accept ballistic conduction]

[10e] Ballistic transport contributes to the high conductivity of the armchair type of these materials. These materials are analogous to rolled-up graphene sheets.

ANSWER: carbon nanotubes [or CNTs; accept single-walled carbon nanotubes or SWCNTs; prompt on nanotubes]

[10h] Confined materials exhibiting ballistic transport can serve as real-life examples of these dynamical systems. Trajectories in these Hamiltonian systems reflect specularly off the boundary of a configuration space.

ANSWER: dynamical billiards [accept billiard map]
<Physics>