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### Tossups:

1. **One work by this artist, which involves a person sitting on a bench and writhing while wearing a purple tube-like garment, is set to a piano piece by Zoltan Kodaly. Another work by this artist of *Lamentation* features a goblet, chess pieces, and a conch shell as props and is about the Bronte sisters being wooed by the Dark Beloved and the Poetic Beloved. This choreographer of *Deaths and Entrances* emphasized (\*) breath and motion in a namesake method of dance. Another dance choreographed by this artist has maid, warrior, and martyr figures representing the three roles of Joan of Arc - that dance is *Seraphic Dialogue*. This woman choreographed a work with sets designed by Isamu Noguchi which featured a Revivalist preacher and a newlywed pioneer couple building a house and dancing to variations on the song "Simple Gifts." For 10 points, name this choreographer of *Appalachian Spring*.**

ANSWER: Martha Graham

2. **A set of 82 commentaries on *Transmission of the Lamp* are included in a text titled for this adjective compiled by Yuanwu Keqin [ywen-wu kuh-chin]. Eyes described by this adjective were one of the characteristic features of the "barbarian" who brought the Zen tradition to China, Bodhidharma. A hand copy of a text with this adjective in its title was made in a single night by the monk Dogen, who made the text standard in the Sōtō school. A poison called *halahala* which had the effect of changing (\*) skin to this color emerged while the gods attempted to produce *amrita*. This adjective lends its name to a "record" of 100 *koans* from Zen Buddhism. A poison from the churning of the ocean of milk gives this color to Shiva's throat. For 10 points, Vishnu's avatars Rama and Krishna are often depicted with skin of what color?**

ANSWER: blue

3. **A multidimensional form of this technique is used in one stage of the MudPIT technique. An "Ultra" version of this technique was developed by the Waters corporation. Long-tailing of the peak of 2,2-bipy in this technique occurs when there is metal contamination. ESLD detectors can be used alongside this technique when the analyte isn't UV active. The composition of the (\*) mobile phase in this technique is continuously varied in its gradient elution mode, and is kept constant in isocratic flow. Originally invented by Csaba Horvath, this technique uses a packed bed with very small bead volume. For 10 points, name this form of column chromatography in which the sample is forced through the substrate at high psi.**

ANSWER: HPLC [or high-performance liquid chromatography; or high pressure liquid chromatography]

4. **Gerald Sussman and Guy Steele coined the name for a technique used in this paradigm in which an extra argument is included to indicate what should be done after a routine has finished; that technique is continuation passing style. A technique called "currying," which is used to set the arity of certain constructs to "one," is used to implement (\*) first-class forms of the namesake things in this paradigm. Pattern matching is generally prevalent in this style, which often only evaluates a function argument if it is actually used due to "lazy evaluation." Technically, printing to a screen is not allowed in this style, since the "pure" form of this style avoids side effects. Languages which use this paradigm include ML, Scheme, and Haskell, and it is closely modeled on the lambda calculus. For 10 points, name this programming paradigm, which views programs as the namesake mathematical constructs.**

ANSWER: functional programming

5. **This work's narrator notes that mailboxes first made him aware of another character, who is challenged to name an example of real literature and answers *Wuthering Heights*, only to reveal she is talking about the movie. A character in this work is said to be homosexual because if a man doesn't like horse racing or baseball, he "don't like girls." This novel's protagonist is carved in an African statue, dates (\*) Rusty Trawler, and annoys Mr. Yuniyoshi. This work's protagonist runs away from her much older husband Doc and changes her name from Lula Mae to become an actress. After she passes information to the gangster Sally Tomato in prison, she**

is abandoned by Jose Ybarra-Jaegar and travels to Brazil. For 10 points, name this novella narrated by the writer “Fred” about Holly Golightly, a Truman Capote work that was adapted into an Audrey Hepburn film.  
ANSWER: Breakfast at Tiffany's

6. John Trudell was called the “Voice” of this place, while LaNada Means and Stella Leach helped him restore the reputation of a movement in this place following the death of 13-year old Yvonne Oakes. A group led by Allen Cottier attempted to pay 47 cents per acre for this location in response to the Treaty of Fort Laramie, as it had been declared ‘surplus federal property.’ Un-Thanksgiving Day is held in this location, where a two-year (\*) occupation by the IOAT helped inspire the American Indian Movement to seize the Mayflower II in 1970. A resident of this place published *Diseases of Canaries* despite being incarcerated in Leavenworth, and was known as the “Birdman.” Frank Morris and Clarence and John Anglin escaped from this place in 1962 on an unsteady raft. For 10 points, name this prison that was home to Al Capone, an island outside of San Francisco.

ANSWER: Alcatraz Island

7. This thinker claimed that the problem in Mississippi “is not that not enough Negroes have the vote but that too many white people are voting” in a 1965 Oxford Union debate with James Baldwin. This man’s first book accused Professor Raymond Kennedy of making a “cult of anti-religion”; that work included critiques of teaching “collectivism” and “Keynesian economics.” This political thinker asserted that society would be better off governed by the first (\*) 2000 names in the phone book than by Harvard’s faculty. The most famous of this thinker’s publications claimed to “stand athwart history, yelling Stop.” This man threatened to “sock [Gore Vidal] in the goddamn face” after Vidal called him a “crypto-Nazi.” After Barry Goldwater’s defeat, this man’s namesake rule told conservatives to vote for the “rightwardmost viable candidate.” For 10 points, name this founder of *National Review* magazine, widely regarded as the father of modern American conservatism.

ANSWER: William Frank Buckley, Jr. [or William Francis Buckley]

8. One leader of these people bought a set of armour for a Moorish dwarf named Zerco whom he kept as a pet. Ardaric, a Gepid king and a former subject of these people, precipitated the breakup of their empire by killing their king, Ellac, at the battle of Nedao. Joseph de Guignes proposed a link between this group and the Xiongnu of northern China. These people forced the Treaty of Margus on the (\*) Eastern Roman Empire to make them pay an annual tribute of gold. A leader of these people killed his brother Bleda to secure his rule and was defeated by a joint Visigothic-Roman army led by Theodoric I and Flavius Aetius at the Battle of the Catalaunian Plains. For 10 points, name this nomadic group that swept in from the Central Asian steppe to conquer large parts of Europe under Attila.

ANSWER: Huns

9. One woman with this profession reflects that the archetype of marriage is a couple watching children throwing a ball; that woman later contemplates the leaf pattern on a tablecloth to help finish a job she started ten years ago. A man with this profession has an affair with Blanche, causing her to abandon her husband Dick Stroeve. A character with this job is not taken seriously because of her “puckered-up face” and “Chinese eyes”; it’s not “author,” but that friend of (\*) William Bankes is later told by Charles Tansley that women are bad at this job. James and Cam’s mother Mrs. Ramsay inspires Lily Briscoe’s pursuit of this profession in *To the Lighthouse*, and Charles Strickland moves to Tahiti to pursue it in *The Moon and Sixpence*. For 10 points, name this occupation of Basil Hallward, an artist who creates the picture of Dorian Gray.

ANSWER: painter [prompt on artist before mention]

10. In the leadup to this war, a freighter called the *Emma* was bombed by a group called the Red Hand. This conflict was often called “the war without a name”, and a book titled after this war “according to the documents” was locked up in archives for 30 years. One side in this conflict was called either “road cutters” or “throat cutters” due to a mistranslation. The Harkis were auxiliaries who fought for one side in this war, one faction of which was destroyed after a series of assassination attempts in (\*) cafes. The pact that ended this war guaranteed access to a nuclear testing facility at Mers-el-Kebir, as well as protection for both Sephardi Jews and the Pied-Noirs. Raoul Salan formed the OAS, which opposed the Evian Accords that ended it. It was eventually won by the FLN. Earlier in this war, a successful coup d’état ended the Fourth Republic and brought de Gaulle to

power. For 10 points, name this 1954 to 1962 war in which a North African country gained independence from France.

ANSWER: Algerian War of Independence

11. This piece inspired an Anthony Tudor-choreographed ballet piece titled “Pillar of Fire.” A transition between E-flat minor and D major is linked with a single sustained B-flat in this piece, which opens with a cello and viola playing four brooding half note Ds. Edward Clark conducted the premiere of the string orchestra arrangement of this piece, and the Rosé Quartet premiered it in its original form. This piece, likely inspired by the composer’s strong feelings for his teacher’s daughter (\*) Mathilde von Zemlinsky, was rejected by the juries of a competition in Vienna due to its use of an inverted ninth chord. It transitions from D minor to D major through the entire piece and was inspired by a Richard Dehmel poem in which a woman admits adultery to her lover. For 10 points, name this programmatic sextet by Arnold Schoenberg.

ANSWER: Transfigured Night [or Verklärte Nacht]

12. This writer declared himself a “hedonistic reader” in an essay on Paul Groussac, and both Clara Passafari and Adolfo Prieto have criticized this thinker’s “impressionistic” literary analysis. This writer quoted Suarez Miranda’s *Travels of Prudent Men* in “On Exactitude in Science” while discussing Lewis Carroll’s invention of a map at “the scale of a mile to the mile,” and he speculated a universe with infinite time but finite mass in *A History of Eternity*. A character created by this man sees “a silvery cobweb in the center of a (\*) black pyramid” and “convex equatorial deserts” in the basement of Carlos Argentino Daneri while he mourns the death of Beatriz Viterbo. This author wrote about “purifiers” who destroy books in an infinite collection of bookshelves. For 10 points, name this Argentinian author of “The Aleph” and “The Library of Babel.”

ANSWER: Jorge Luis Borges

13. The spectrum of these devices can be expanded by giving them a thicker layer with low electric field in a manufacturing process called “deep depletion.” Leaving these devices active for a long time and looking at tracks on the readout is one method of conducting polar drift alignment. Data reduction from these devices usually includes bias reduction, flatfielding, and darkframe subtraction procedures. These devices, which come in interline and full-frame versions, can be coupled with a microchannel plate and a phosphor screen for (\*) intensification. In these instruments, which were invented by Willard Boyle and George Smith, incident photons are converted to packets of electrons and shuffled to the edge. These instruments usually have p-doped MOS capacitors representing each pixel. For 10 points, name these charge manipulating electronic components found in cameras.

ANSWER: CCD [or charge-coupled devices]

14. In case this cause was successful, Roy Romanow made a Constitutional Contingencies group. One leader of this cause said that once a certain result had been obtained, people would be like “lobsters in a cage.” The Sherbrooke Declaration and a 1998 Supreme Court Reference decision dealt with a threshold for this cause, the success of which required a clear majority on a clear question per the Clarity Act. One leader of this cause blamed one failure to achieve this cause on “money” and the “ethnic (\*) vote.” Between the 1993 and 1997 elections, the Official Opposition was the Bloc, or BQ, which espoused this cause. Supporters of this cause were led by Lucien Bouchard, Jacques Parizeau, René Lévesque, and voted “oui” in 1980 and 1995. For 10 points, name this cause that failed to win two referendums over the future status of the French-speaking province of Canada.

ANSWER: Quebec sovereignty-association [or equivalents like Quebec separatism, an independent Quebec, Quebec seceding from Canada, or the Yes/Oui side during the Quebec sovereignty referendums; prompt on Yes or Oui]

15. Members of the resistance group Suraya Rimah were executed before the beginning of this campaign. The letter M representing “moqawama” appeared on walls before this campaign and one side in this campaign explicitly involved the Battle of the Trench in their preparations. Sulfur mustard agents were detected in the shell fragments from one side in this campaign, which ran its operations from Qayyarah Airfield. The Debaga Camp was expanded before this campaign began to accommodate an expected (\*) refugee outflow. Donald Trump repeatedly questioned why the military strategy for this event was made public before Haider al-Abadi

announced its beginning on October 17th, 2016. For 10 points, name this ongoing United States-backed military event that involves using Kurdish Peshmerga and Iraqi forces to reclaim a city from ISIS.

ANSWER: Reclaiming Mosul or Battle of Mosul or Operation "We Are Coming, Nineveh" or Qadimun Ya Naynawa [accept reasonable equivalents involving an attack on Mosul]

16. **The nkd1 and nkd2 genes are named for the fact that mutations in them cause the outermost layer of this tissue to not develop. A sample of this tissue found in barley is used in an assay for gibberellins. Cotyledonous organisms do not retain this tissue beyond maturity of the organ in which it is stored. This tissue is generated when two polar nuclei fuse with (\*) one of the sperm nuclei from pollen, in a process of double fertilization.**

Amylase from the outer aleurone layer of this tissue digests the starchy portion of this tissue in cereal grains. For 10 points, name this triploid tissue that nourishes the growing embryo inside a seed.

ANSWER: endosperm

17. **This play is interspersed with asides about the Nicolas Bataille production of it, in which a woman does not throw her socks very far after criticizing men for powdering their noses fifty times a day. In this work, a man wonders why the papers always give the age of deceased persons but not newborns, and the "handsomest corpse in great Britain," (\*) Bobby Watson, is discussed in this play, which takes place in an "English interior" on an "English evening." The main characters are visited by Donald and Elizabeth, who forget that they are married but remember their child with one white and one red eye, before being proven wrong by the maid Mary. In this play, the Fire Chief mentions that the title character "always wears her hair in the same style." For 10 points, name this play about the absurd dinner party of the Smiths and the Martins, by Eugene Ionesco.**

ANSWER: The Bald Soprano

18. **Works by this artist confused with those of Il Sodoma include a painting bought by the Marquess of Lansdowne in which an infant Christ plays with a sewing implement. Raphael's *Madonna of the Pinks* is probably based on a work by this artist "rediscovered" by Leon Benois. This artist of two versions of the *Madonna of the Yarnwinder* created a painting with two musician angels on its side panels and another angel by the side of baby Christ identified as either Gabriel or Uriel - that painting's background features a curved road amidst a (\*) craggy landscape. This artist painted the angel at left of the version of *The Baptism of Christ* executed by his teacher, Andrea del Verrocchio. His other Biblical scenes include the *Madonna of the Rocks* and a painting in which Judas' face is cast in shadow at a feast. For 10 points, name this artist of the *Mona Lisa*.**

ANSWER: Leonardo da Vinci [accept either underlined portion]

19. **This fate happened to Mestra's father, whom Demeter had punished for cutting down a sacred grove; Demeter sent Limos to punish him, forcing Erysichthon to do this action to himself. This thing happened to Abderus while he was assisting Hercules during his eighth labor, and in revenge, Hercules caused this thing to happen to the giant king of Thrace. This was the method of death of travelers who were forced by Sciron to (\*) wash his feet and in one case, this was done to a rock instead of its intended target due to a trick by Rhea. It's not being turned into an animal, but Artemis caused this thing to happen to Actaeon after he stumbled on her naked in the forest, and the mares of Diomedes would often do this thing to people. For 10 points, name this thing which happened to the children of Kronos.**

ANSWER: being eaten [or being eaten alive, or cannibalism, or autophagy until Abderus, or being eaten by horses or snakes or hounds; prompt on answers like extreme hunger until "to himself"]

20. **One philosopher from this modern-day country argued that all experience was constituted by the mind itself, and that the world has an "eternally complete consciousness" from which an "animal organism" gains knowledge. Another philosopher from this country argued that reality is a non-contradictory but internally diversified system in *Appearance and Reality*. A work titled "Letters from" this nation opens with a discussion of the Quakers; that work by (\*) Voltaire also praises a man from this country who argued that substances were "combinations of simple ideas," that all ideas are derived from experience through sensation or reflection, and that no ideas are innate, his "tabula rasa" theory. Gottfried Leibniz wrote a rebuttal to that thinker from this country titled *New Essays on Human Understanding*. For 10 points, name this country home to John Locke.**

ANSWER: England [or Great Britain; or the United Kingdom]

### Bonuses:

1. Answer some questions about the role of microtubules in cell division, for 10 points each:

[10] These microtubules exist only during mitosis, but they only connect to the centrosome and not to the kinetochore structure. They are believed to help orient the mitotic spindle.

ANSWER: Astral microtubules

[10] In microtubule nucleation, gamma tubulin forms a complex of this type of fold symmetry. This is also the number of protofilaments that are arranged in a ring to comprise a microtubule.

ANSWER: 13

[10] During this phase of mitosis, chromosomes are aligned at the equatorial plane of the cell before they are pulled to opposite poles of the cells by spindle fibers in the next stage, anaphase.

ANSWER: metaphase

2. This tongue-in-cheek name referring to the highest caste of Indian society may have referred to the elite, Ivy-league associations of its members. For 10 points each:

[10] Name this nineteenth century literary group centered in Boston whose members included Oliver Wendell Holmes, Sr and Henry Wadsworth Longfellow. Its members often overlapped with the Fireside Poets.

ANSWER: the New England Brahmins [or "Boston Brahmins"; prompt on Brahmins]

[10] This member of the New England Brahmins is best known for his satirical *A Fable for Critics*. His grandson Robert also became a poet; his works include "Skunk Hour" and "The Quaker Graveyard in Nantucket."

ANSWER: James Russell Lowell

[10] This poem by Oliver Wendell Holmes describes a "ship of pearl" and the "silent toil/That spread his lustrous coil/Still, as the spiral grew/He left the past year's dwelling for the new" in its praise of an aquatic creature.

ANSWER: "The Chambered Nautilus"

3. This region of the atmosphere ranges in height from around 9 to 17 kilometers, depending on whether the ground at the Equator or the poles is used as the reference level. For 10 points each:

[10] Name this region of the atmosphere that acts as a barrier on the upward movement of rising warm air. It serves as the boundary between the troposphere and the stratosphere.

ANSWER: tropopause

[10] At the tropopause, this quantity changes from positive to negative. Often symbolized with a gamma, it is defined as the negative of the rate of change of temperature with respect to altitude.

ANSWER: lapse rate

[10] Differences in the "dry" and "moist" lapse rates are responsible for the formation of this kind of wind that occurs on the leeward side of a mountain. It is caused by a rain shadow.

ANSWER: fohn wind [or foehn wind]

4. This work has an epigraph falsely attributed to the Book of Ecclesiastes. For 10 points each:

[10] Name this 1981 work which analyzes the semiotics of postmodern culture. It argues that many apparent symbols or representations are not rooted in, or even supercede, reality.

ANSWER: Simulacra and Simulation

[10] *Simulacra and Simulation* is by this French philosopher and author of *The Vital Illusion* who claimed the titular conflict served only to prop up simulated political goals and authority in *The Gulf War Did Not Take Place*.

ANSWER: Jean Baudrillard

[10] In *The Illusion of the End*, Baudrillard argues that historical metanarratives are meaningless today, referencing the "end of history" discussed by this author of *The Phenomenology of Spirit*.

ANSWER: Georg Wilhelm Friedrich Hegel

5. These objects are backed by the value of water, and have been more popular than NCR dollars. For 10 points each:

[10] Name these things which became valuable as currency in New California after the Great War destroyed most of the technology necessary to create and paint them. A rare "Sunset" variant has a blue star on the underside.

ANSWER: bottle caps [or Nuka cola caps prompt on "Hubbucks" or "Hubscript"; prompt on answers like "those coins from *Fallout*"]

[10] Bells serve as currency in this Nintendo series where your villager can buy and sell items from the anthropomorphic tanuki Tom Nook. Games in this series include "Wild World" and "New Leaf."

ANSWER: **Animal Crossing** [or **Dobutsu no Mori**]

[10] A fictional currency called the *penya* is used to purchase stuff like hoverboards in this MMO developed by Aeonsoft. This game, which is often referred to by an acronym, is named for an unusual mode of transportation that is accessible when players reach level 20.

ANSWER: **FlyFF** (rhymes with “strife”) or **Fly For Fun**

6. 1. Objects found in this area include a crested helmet, two silver spoons, and a large circular shield. For 10 points each:

[10] Name this archaeological site near Woodbridge, East Anglia. Its many mounds conceal ancient British artifacts, most notably a buried ship.

ANSWER: **Sutton Hoo**

[10] Artifacts at Sutton Hoo were buried by this ethnic group, named after two Germanic tribes who migrated to Britain. Their leaders included King Alfred and Ethelred the Unready, and they were defeated by the Normans.

ANSWER: **Anglo-Saxons** [anti-prompt on more specific answers such as **Angles** or **Saxons**]

[10] According to the *Histori Brittonum*, this Briton king paid Hengst and Horsa Saxon army to fight the Picts and gave them Kent, but was forced to cede Essex and Sussex after they killed his similarly named son in battle.

ANSWER: **Vortigern** [or **Vortigen**; or **Vortiger**; or **Wyrtegeorn**]

7. This work lists such actions as “to communicate with Mars, converse with spirits/To report the behaviour of the sea monster.” For 10 points each:

[10] Name this set of poems which begins “Time present and time past are both perhaps present in time future.” It contains the sections Burnt Norton and East Coker.

ANSWER: **“Four Quartets”**

[10] “Four Quartets” was written by this author of “The Love Song of J. Alfred Prufrock” and “The Hollow Men.”

ANSWER: T. S. **Eliot**

[10] The last section of “Four Quartets,” Little Gidding, ends with an observation that “all manner of thing shall be well” when these two items “are one.”

ANSWER: the **fire** and the **rose**

8. Anatomy textbooks love to remind us that this religious object is the namesake of a heart valve. For 10 points each:

[10] Name this white bishop’s hat which replaced the papal tiara for the first time during Pope Benedict XVI’s inauguration.

ANSWER: **mitre** [or **miter**]

[10] Most Jewish men only wear this brimless head covering during prayer, but some denominations even require women to wear these caps also called *kippah*.

ANSWER: **yarmulke**

[10] The *dastaar* is a mandatory head covering worn by the Amritdhari practitioners of this religion, included as part requirements that also require its members to carry a *kirpan*.

ANSWER: **Sikhism**

9. Name some things related to project MKULTRA, for 10 points each:

[10] In an attempt to develop mind control techniques, the CIA dosed numerous subjects with this drug nicknamed acid. Subjects included author Ken Kesey as well as several unsuspecting johns in San Francisco during Operation “Midnight Climax.”

ANSWER: **LSD** [or **lysergic acid diethylamide**]

[10] Much of MKULTRA was a direct result of this program in which the US State Department tried to recruit Nazi scientists after the end of WWII.

ANSWER: Operation **Paperclip**

[10] During the program, CIA funded psychiatrist Donald Cameron’s studies of “positive driving” in this country. A conspiracy theory says the CIA was afraid of the U2 spy plane becoming obsolete and induced this country’s cancellation of the Avro Arrow jet program.

ANSWER: **Canada**

10. A UT economist with this surname heads up the Texas Inequality project, which uses the Theil index instead of the traditional Gini coefficient to measure inequality. For 10 points each:

[10] Identify this surname, which also belongs to that man's father, who theorized that the mechanisms of supply and demand had been largely supplanted by corporate planning in *The New Industrial State*.

ANSWER: **Galbraith** [James G. and John K. respectively]

[10] Both Galbraiths' views on economics were heavily influenced by this British economist, who argued that the government should use its spending to control the business cycle in his *General Theory*.

ANSWER: John Maynard **Keynes**

[10] In a 1952 book, John Kenneth Galbraith used this two-word phrase to refer to anti-competitive forces, such as company mergers, which work to influence the market's outcomes and prevent a socially optimal solution.

ANSWER: **countervailing power** [accept *American Capitalism - The Concept of Countervailing Power*]

11. Indigenous people in this modern-day country were designated "raw barbarians." For 10 points each:

[10] Name this modern-day country, whose aboriginal peoples were subjected to the Lamey Island Massacre by Dutch colonists. This modern-day country was the base for the pirate Koxinga [co-SHEEN-guh].

ANSWER: **Taiwan** [or **Republic of China**; or **Zhonghua Minguo**; but not "China" or "People's Republic of China" or "Zhonghua Renmin Gongheguo"]

[10] The Qing were mainly interested in crushing Koxinga because he, and a bunch of other Chinese who fled to Taiwan, supported the restoration of this dynasty which preceded the Qing and is known for its ceramics.

ANSWER: **Ming** dynasty

[10] Qing dynasty claims on Taiwan were lost to Japan, along with the Liaodong Peninsula, in this 1885 treaty, which ended the first Sino-Japanese war.

ANSWER: Treaty of **Shimonoseki**

12. This author's most famous play has no main character but narrates a Silesian uprising in the 1840s. For 10 points each:

[10] Name this author of *The Weavers*, who wrote about Rautendelein's love for Heinrich in *The Sunken Bell*.

ANSWER: Gerhart **Hauptmann**

[10] In this Hauptmann play, Mother Wolff, who gets information from her daughters Leontine and Adelheid, successfully steals a pile of wood, as well as the title object, from the pensioner Kruger.

ANSWER: *The **Beaver Coat***

[10] Hauptmann was a proponent of this theatrical style which sought to show reality through rejecting idealism and darker subjects like sex or alcohol. Unlike realism, it attempts to determine reasons for behavior like environmental factors or heredity.

ANSWER: **naturalism**

13. Answer some questions about the movement of atoms from high concentration to low concentration, for 10 points each.

[10] This proportionality constant between molar flux and concentration gradient is generally predicted by the Arrhenius equation. Adolf Fick derived his namesake law with this quantity in 1855.

ANSWER: **Diffusion coefficient** [accept diffusivity]

[10] This equation states the diffusion coefficient is equal to the drift velocity times absolute temperature times Boltzmann's constant divided by applied force.

ANSWER: **Einstein**-Smoluchowski relation

[10] This equation, necessary to solve the Navier-Stokes equations for turbulent flows, finds a constant inversely proportional to the diffusivity, the Sherwood number, by way of the Reynolds and Schmidt numbers.

ANSWER: **Churchill-Bernstein** equation

14. Some people believe that this piece may have been dedicated to the wife of Johann Hummel. For 10 points each:

[10] Name this bagatelle in A minor by Ludwig van Beethoven. This piano piece begins with E-D sharp-E-D sharp, which has been suggested by some to be a cryptogram of its title dedicatee, a woman whom Beethoven loved.

ANSWER: **Fur Elise** [or **Bagatelle No. 25** in A minor]

[10] This French Baroque composer is commonly believed to be the first composer to have composed a bagatelle. He was best known for his works for harpsichord such as *Les Barricades Mystérieuses* and his trio sonatas.

ANSWER: Francois **Couperin** [or **Couperin le Grand**; prompt on **Couperin**]

[10] This English composer composed *Five Bagatelles* for clarinet and piano. He is better known for his choral works like *Dies Natalis* and *For St. Cecilia* as well as his clarinet concerto in C minor with a notable *Adagio* second movement.

ANSWER: Gerald **Finzi**

15. For 10 points each, answer the following about isomerization.

[10] Two compounds with this relation to each other rotate plane-polarized light in opposite directions. Substances with non-superimposable mirror images are these in relation to each other.

ANSWER: **enantiomers**

[10] These non-optically active subclass of stereoisomers have multiple stereocenters and mirror images that are superposable over each other.

ANSWER: **meso compounds**

[10] Fumaric acid, an essential metabolite in the body, shares cis-trans metabolism with this toxic tissue irritant, with a melting point of 138C.

ANSWER: **maleic acid** [do not accept maleate, spell malEate if necessary. It's pronounced mal-EE-ate, not MALE-ate]

16. Name some things about disasters that befell the Russian Empire in the late 19th century, for 10 points each:

[10] Name this accident in which a train travelling from Crimea to St. Petersburg derailed, resulting in the death of twenty-three people. This disaster ultimately led to the appointment of Sergei Witte as Director of State Railways.

ANSWER: **Borki** Train Crash

[10] Over 1000 people were trampled at the Khodynka field during a celebration of this Tsar's coronation. Despite supposedly having grieved, his opponents labeled him as "the Bloody." He corresponded in English with a cousin he called "Willy."

ANSWER: **Nicholas II** [or **Nikolay Alexandrovich Romanov**; or **Nicky**; prompt on Nicholas or Nicolai]

[10] Russia suffered from this type of disaster 1891-1892; Tolstoy wrote an article entitled "A Terrible Question" in response to the government's refusal to import foreign grain in response to this type of event.

ANSWER: **Famine** [or other logical equivalent that indicates that **there is not enough food to eat**]

17. This woman weaves a burial shroud, then unweaves it every night, to delay the attention of her suitors. For 10 points each:

[10] Name this woman, the wife of Odysseus, known for remaining faithful to him, even while he was getting it on with Circe and Calypso.

ANSWER: **Penelope**

[10] Penelope has a dream in which an animal representing Odysseus slays a group of these animals, representing her many suitors led by Antinous.

ANSWER: **geese**

[10] This cowherd of Odysseus, along with Telemachus and Eumaeus, helps him kill the suitors. He takes pity on Odysseus when he is disguised by a beggar, and he kills the suitor Pisander.

ANSWER: **Philoetius**

18. After a man threatens to push his wife off a cliff, she asks him to let her worship him by walking around him; once she gets behind him, she pushes him off instead. For 10 points each:

[10] That scene appears in *Kundalakesi*, which, along with *Cilappatikaram* and *Manimekalai*, are part of this Southern Indian language's Five Great Epics.

ANSWER: **Tamil**

[10] Kundalakesi's husband Kaalan turns murderous after she teases him by calling him one of these people, which is fair since he used to be one. Fagin forces Oliver Twist to work as one of these people.

ANSWER: a **thief** [or obvious equivalent]

[10] In addition to producing the Five Great Epics, Tamil was the native language of R. K. Narayan, who depicted this fictional Indian town in such novels as *Swami and Friends* and *The English Teacher*.

ANSWER: **Malgudi**



19. For his project *Dadaglobe*, this artist solicited photos of art as well as a “clear photo of your head (not body),” which, if altered, “should retain clarity,” unsurprisingly resulting in a lot of photos doing neither of those things. For 10 points each:

[10] Name this artist who collaborated with Tristan Tzara on *Dadaglobe*. His works include a toy monkey on cardboard titled *Portrait of Cézanne*, *Portrait of Renoir*, *Portrait of Rembrandt*.

ANSWER: Francis **Picabia**

[10] Many submissions to *Dadaglobe* were this type of art. Examples of works in this medium include Hannah Hoch’s *Cut with the Kitchen Knife through the Beer-Belly of the Weimar Republic* and Matisse’s *Blue Nude II*.

ANSWER: **collage** [or **photomontage**; prompt on “decoupage”]

[10] Dada in America was centered in this Eastern city, home to Picabia as well as Marcel Duchamp. The Museum of Modern Art, which hosted a recent exhibition on *Dadaglobe*, is located in this city.

ANSWER: **New York City** [or **New York**; or **New Amsterdam**; or **The Big Apple**; or **The City So Nice, They Named It Twice**; or **The Modern Gomorrah**]

20. Yuan Chai and Jian Jun Xi jumped onto one of this artist’s works to “improve” it as a piece of performance art. For 10 points each:

[10] Name this artist, who recreated a period of depression by showing a piece with messy everyday objects, *My Bed*. She also embroidered a tent with the names of her sexual partners in *Everyone I Have Ever Slept With*.

ANSWER: Tracy **Emin**

[10] Tracy Emin, along with Jenny Saville and Sarah Lucas, is an example of a “Young Artist” from this country.

The creator of the diamond skull “For the Love of God,” Damien Hirst, also hails from this country.

ANSWER: Great **Britain** [or the **United Kingdom** or **England**]

[10] This other member of the Young British Artists is known for his critiques of various consumerist practices. His piece *Market* is an installation of numerous shop stalls, while he destroyed everything he owned in 2001 for his performance piece *Break Down*.

ANSWER: Michael **Landy**