



PACE NSC 2017 - Round 23 - Tossups

1. *The Times* and *The Daily Mail* attacked this man during a scandal over the shortage of shells at the front. Lord Curzon resigned his position as Viceroy in a clash with this man, who served as Commander in Chief in India from 1902 to 1909. He was killed when the *HMS Hampshire* collided with a mine while on a trip to Russia during World War I. The strength of his British Expeditionary Force necessitated a French retreat from the Upper Nile region in the (*) Fashoda Incident. Posters featuring an image of this man and the slogan "Your country needs YOU" were used for recruitment in World War I. This man was made Lord of Khartoum after massacring eleven thousand Mahdist soldiers at the Battle of Omdurman. For 10 points, name this British general who fought a scorched earth campaign during the Boer War.

ANSWER: Horatio Herbert Kitchener, 1st Earl Kitchener [or Kitchener of Khartoum] <Bentley>

2. This man proclaimed that "modern art can only be born when signs become symbols" in his analysis of the geometrical aspects of paintings. In 1924, this artist exhibited across the United States as part of a four-person tour that also included Lyonel Feininger and Alexej von Jawlensky (yiv-LEN-ski). He referred to "largely unconscious, spontaneous expressions of inner character" as "Improvisations", which he contrasted with his (*) "Impressions" and "Compositions". This author of *Point and Line to Plane* and *Concerning the Spiritual in Art* depicted a white horse racing across a landscape in a painting that inspired Gabriele Münter, Franz Marc, and others. For 10 points, name this Russian-born artist whose painting of a man on horseback was the namesake of *The Blue Rider* group.

ANSWER: Wassily (Wassilyevich) Kandinsky <Bentley>

3. This scientist names a set of four matrices that generate the Clifford algebra $C-L-sub-1-comma-3-R$. During the 1950s, while this man was teaching at Florida State University, his theory of electromagnetic fields composed of quantum harmonic oscillators was finally renormalized into modern QED. An equation developed by this scientist predicts that the electron g-factor is exactly two and recasts the time-dependent (*) Schrodinger equation to account for relativity. He developed a notation in which "left angle bracket, psi, vertical bar" represents the complex conjugate of a wavefunction. This man proposed that a hole in a sea of negative-energy electrons really represents an electron with a positive charge, or positron. For 10 points, name this British physicist who proposed magnetic monopoles and antimatter.

ANSWER: Paul (Adrien Maurice) Dirac <Silverman>

4. David Weir argues that this work's image of an *Acherontia* inspired the depiction of an anopheles mosquito that its creator made four years later for a documentary depicting poor mountain-dwelling peasants called *Land Without Bread*. A shot of a sea urchin in this movie occurs after a transition from a shot showing the armpit hair of a woman played by Simone Mareuil (mah-RUH-ee). A man drags two grand pianos filled with (*) donkey carcasses in a scene from this movie, which earlier depicts a man poking a severed human hand with his cane. This film's makers later collaborated on the film *The Golden Age*, and it includes an early scene in which an eye is cut with a razor. For 10 points, name this plotless surrealist film, a collaboration between Luis Bunuel and Salvador Dali.

ANSWER: *Un Chien Andalou* [or *An Andalusian Dog*] <Jose>

5. The man delivering this speech sarcastically asked "Are fleets and armies necessary to a work of love and reconciliation?" Edward Carrington was so moved by this speech that he was buried on the spot where he heard it. Addressed to Peyton Randolph, it first appeared in an 1817 biography by William Wirt. Near its end, the speaker asks, "Is life so dear, or (*) peace so sweet, as to be purchased at the price of chains and slavery?" It was given in St. John's Church rather than the capital due to harassment from the forces of Lord Dunmore. The title line of this speech comes from Joseph Addison's tragedy *Cato*. After this March 23, 1775 speech, the Virginia Convention joined the United Colonies. For 10 points, name this speech given by Patrick Henry.

ANSWER: "Give Me Liberty or Give Me Death" speech <Bentley>

6. One of these places in Stockholm is supposedly haunted by the Silverpilen, or "Silver Arrow", and features a huge fresco depicting a timeline of human civilization at Rissen. The first of these places in mainland Europe was built in Budapest in 1894. Hector Guimard designed several Art Nouveau-style entrances to these places, which were painted green to resemble worn-out copper. One of these places that opened at the 1900 Exposition Universelle inspired a short (*) Imagist poem that describes "the apparition of these faces in the crowd." Harry Beck created a pioneering topological map for one of these systems that regularly reminds its visitors to "mind the gap." For 10 points, identify these public transportation systems that are usually built underground.

ANSWER: metro systems [or rapid transit systems; or subway systems; or metro stations; or subway stations; or obvious equivalents; prompt on anything mentioning trains] <Shimizu>

7. This story is the basis of Sloane Crosley's first novel, in which Victor's search for a piece of Nazi loot takes him to its author's estate. This story's narrator exclaims "How strange life is, how fickle!" after describing a "strong, hard, and rough" woman who talks loudly as she washes floors. This story's protagonist dreams of "fine dinners, of shining silverware" when a man exclaims "Beef stew! What could be better!" A man in this story (*) buys his wife a dress so that they can attend a ball hosted by the Ministry of Education. Upon meeting an old friend in the Champs-Élysées (SHAWN-zay-lee-ZAY) after ten years of hard work, the main character of this story learns that an object was worth just five hundred francs. For 10 points, Mathilde Loisel (mah-TEELD lwah-ZELL) borrows a piece of fake jewelry in what Guy Maupassant story?

ANSWER: "The Necklace" [or The Diamond Necklace]; or "La Parure"] <Brownstein>

8. This character owned a loom decorated with a picture of Apollo changing his course, and used it to depict the quarrel between Atreus and Thyestes. An event centering on this figure is preceded by a scene in which a serpent climbs a tree, eats eight fledgling sparrows and their mother, and is then turned to stone. She is eventually sent to Brauron after stealing a *xoanon* (ZOH-uh-non) to help Pylades and his companion. She is forced to ritually (*) sacrifice trespassers on the land of King Thoas after being replaced with a deer and spirited away. According to Euripides, a prophecy of Calchas requires this woman to be brought to Aulis in order to appease Artemis. For 10 points, name this sister of Electra and Orestes whose father Agamemnon is forced to sacrifice her so the Greek fleets can sail to Troy.

ANSWER: Iphigenia <Carson>

9. Systems featuring this parameter must have at least two degrees of freedom to avoid time-like singularities. Perlmutter, Schmidt, and Riess ("reese") were given the 2011 Nobel Prize in Physics for studying type Ia (one-A) supernovae that showed the significance of this parameter. The "phantom" form of this component satisfies equations of state where a parameter denoted lowercase w is less than negative one. This parameter may be caused by the potential energy of the (*) quintessence field, or it might manifest itself through the cosmological constant. In many models, the ratio of this parameter's density and pressure determines whether or not the "Big Rip" occurs. For 10 points, what unobserved quantity has been posited to explain the accelerating expansion rate of the universe?

ANSWER: dark energy [prompt on w until it is read; accept dark energy density or dark energy pressure; prompt on cosmological constant; prompt on energy; prompt on lambda] <Jose>

10. This periodical published an essay that concludes with a call to "end the racial nightmare, and achieve our country;" that essay, "Letter from a Region in my Mind," became the second section of James Baldwin's *The Fire Next Time*. The basketball profile "A Sense of Where You Are" was one of John McPhee's many contributions to this periodical, which rose to prominence under Harold Ross. In 1946, this magazine devoted a full issue to (*) John Hersey's report on the Hiroshima bombing. This magazine received an unprecedented flood of angry letters for a story in which Tessie Hutchinson draws a paper slip with a black spot. For 10 points, name this magazine that published Shirley Jackson's "The Lottery," whose covers often feature the monocled Eustace Tilley.

ANSWER: *The New Yorker* <Bollinger>

11. An inventor of these types of weapons learned his wife Clara Immerwahr had killed herself after he returned from watching their first use. Hugo Stolzenberg supplied weapons of this type for use in Spain's conflict with Abd el-Krim during the Third Rif War. In the 1930s, the company IG Farben developed a new weapon of this type codenamed GA. One weapon of this type was developed at the (*) Kaiser Wilhelm Institute under the direction of Fritz Haber and was first used on April 22, 1915, at Ypres (EEP-ruh). P helmets dipped in hexamine were used by Allied troops against these types of weapons. Some of these types of weapons make use of blister agents and were dispersed through the wind. For 10 points, name this type of weapon that might choke soldiers in trenches not wearing masks.

ANSWER: chemical weapons [or mustard gas; or chlorine gas; or poison gas; or phosgene gas] <Bentley>

12. Carbonic anhydrase and this protein localize to the octahedral microcompartments found in *Synechococcus*. This enzyme's substrate is regenerated in a cycle of transketolases and transaldolases that converts five three-carbon compounds to three five-carbon compounds. This protein, which is oddly active at a pH of 8, has a turnover number around one ha Hertz, making it one of the (*) slowest enzymes. It turns ribulose 1,5-bisphosphate to 3-phosphoglycerate. This protein is segregated to bundle-sheath cells and is kept out of mesophyll cells in C4 organisms, which prevents its wasteful photorespiration. It adds carbon dioxide CO₂ to organic sugars in the Calvin cycle. For 10 points, name this most abundant protein on Earth, which makes up about half the weight of photosynthetic leaves.

ANSWER: **RuBisCo** [or **ribulose bisphosphate carboxylase**; or **ribulose 1,5-bisphosphate carboxylase**; or **RuBPCase**] <Silverman>

13. A massive 2,000-year-old system for growing this crop was built by the Igorot (ego-ROTE) inhabitants of the Ifugao (ee-foo-GOW) region. Many growers of this crop simultaneously grew the mosquito fern to promote this crop's well-being. It's not cannabis, but the *sativa* species of this crop is the most widely consumed. Activist Vandana Shiva vehemently opposes the development of a genetically modified Vitamin A-rich (*) "golden" form of this crop. This crop is grown in the Philippine Cordilleras in a series of hand-carved terraces. Water buffalo are often used to plow fields of this crop, whose varieties include India's basmati and Thailand's jasmine. For 10 points, name this grain often grown in paddies, a staple of many cuisines throughout Asia.

ANSWER: **rice** [or **Oryza sativa**; accept Asian **rice**] <Shimizu>

14. A housekeeper in this novel is referred to as "Ribbons" and has nightly drinking parties with her boss until she is caught opening his office safe. In this novel, a portrait of a fat man on an elephant is sold at an estate auction. A soldier in this novel flees Brussels on an overpriced horse he bought from the main character. The protagonist of this novel performs a charade of Clytemnestra and throws a dictionary out of a coach's window after (*) graduating in the first chapter. That protagonist of this novel has romances with Lord Steyne and Jos after separating from Rawdon Crawley. In this novel, George Osborne marries a graduate of Miss Pinkerton's academy named Amelia Sedley. For 10 points, name this "novel without a hero" about Becky Sharp by William Makepeace Thackeray.

ANSWER: **Vanity Fair** <Brownstein>

15. The hormone that activates synthesis of this compound is part of the same polypeptide as melanocyte-stimulating hormone, which is why deficiencies in it often cause hyperpigmentation. Dexamethasone agonizes this compound's receptors. It is made by adding three hydroxyl groups at carbons 11, 17, and 21 to progesterone in a pathway that diverges to make aldosterone. Poison ivy rashes are often treated by (*) topical administration of this compound, which causes feedback inhibition of the hypothalamus-pituitary axis. This compound, which is overproduced in Cushing's syndrome, is made in a namesake part of the adrenal glands upon stimulation by ACTH. Like epinephrine, it raises blood sugar and pressure. For 10 points, name this steroid that regulates the body's "stress" response.

ANSWER: **cortisol** [or **hydrocortisone**; do not accept or prompt on "cortisone"] <Silverman>

16. A piece in this key was published, at its composer's insistence, without the final-movement cadenza added by its dedicatee Hanuš Wihan (HA-noosh vee-HAHN). Johannes Brahms fell asleep during a performance of a single-movement piece in this key; that piece, which opens with G octaves and a descending G Phrygian scale, is an early example of double-function form. A work that repeatedly quotes the composer's cantata *Wir danken dir* (veer DAHN-ken deer) is in this key, as are Dvořák's Cello Concerto and Liszt's (*) Piano Sonata. That composition titled for this key has a Credo section titled "Symbolum Nicenum" that centers on a "Crucifixus" in 3/2 time, and opens with an F-sharp minor Kyrie. This key's relative major is D major, and its key signature has two sharps. For 10 points, name this minor key in which J.S. Bach wrote a famous late mass.

ANSWER: **B minor** [or **H-moll**; prompt on partial answer; accept **B** alone only after "minor" is read; accept **Mass in B minor**] <Carson>

17. After Jesus heals ten people with this condition in the Gospel of Luke, only one of them, a Samaritan, thanks him. After being told to despise and hate what he had loved carnally and desired, St. Francis kissed the hand of a man with this condition. The founder of St. Joseph's Hospital in Syracuse, St. Marianne Cope, cared for a saint with this condition at the end of his life. That saint, Father (*) Damien, contracted this disease while on the island of Moloka'i helping Hawaiians inflicted with it. Institutions that cared for people with this disease often called "lazar houses" because they were dedicated to St. Lazarus. For 10 points, Chapter 13 of the Book of Leviticus states that people with what disease, which causes disfiguring sores, are unclean?

ANSWER: **leprosy** [or **lepers**; accept **Hansen's disease** or **HD**] <Cheng>

18. A woman born in this modern-day country established the British Hotel to provide aid to troops fighting in the Crimean War and wrote the bestselling autobiography *Wonder Adventures of Mrs. Seacole in Many Lands*. This country's House of Assembly ceded its power to become a Crown Colony following an 1865 rebellion led by Paul Bogle. Over one hundred sugar plantations in this country were destroyed in a Sam Sharpe-led (*) Christmas rebellion. A man born here immigrated to the US and founded the Universal Negro Improvement Association. Back-to-Africa proponent Marcus Garvey was born in this country. Runaway slaves in this country fought the Maroon Wars. For 10 points, name this former British colony in the Caribbean, site of the devastating 1907 Kingston earthquake.

ANSWER: **Jamaica** <Bentley>

19. The anxiety of people in this profession can be measured by the CSAI-2. Biologist Yannis Pitsiladis was unable to find genetic differences in Jamaicans in this profession, an anecdote related in David Epstein's recent book looking for a "gene" for these people. People in this profession who suffer from a type of focal dystonia may have to relearn how to perform a simple task in order to avoid the involuntary (*) muscle contractions characterized by the syndrome. Dan McLaughlin has been testing whether one can become an expert in this profession by following Malcolm Gladwell's 10,000 hours dictum. People in this profession may suffer from a phenomenon known as the Yips. For 10 points, name these people who might visit a psychologist to more consistently throw strikes.

ANSWER: **athletes** [or **golfers**; or **sprinters**; or **runners**; or **baseball players**] <Bentley>

20. A letter in this novel describes an old man practicing walking on lawn steps where he'd fallen "as though he hoped to find some precious jewel he had dropped." This novel's protagonist repeats "I am unable to assist in this matter" when a dinner guest interrogates him on current events to ridicule democracy. This novel discusses Giffen's, a brand of silver polish that helps ease relations between Lord Halifax and Herr Ribbentrop at a conference hosted by a (*) Nazi sympathizer. The narrator of this novel, who now works for the American Mr. Farraday, narrates his road trip through the English countryside to visit his former co-worker Miss Kenton, whom he hopes to bring back to Darlington Hall. For 10 points, name this novel about the butler Stevens by Kazuo Ishiguro.

ANSWER: *The Remains of the Day* <Brownstein>

21. A field that is "formally [this adjective]" can be equipped with an ordering to become an ordered field. The only complete Archimedean ordered field is comprised of these numbers. These numbers can be constructed *from* another set by Dedekind cuts because *that other* set is dense in the numbers described by this adjective. Georg Cantor proved via diagonalization that this set has a cardinality of (*) aleph-one, which is the cardinality of the power set of the integers; that result implies a bijection between this set and the open interval from zero to one. According to the fundamental theorem of algebra, these numbers lack algebraic closure because polynomials with coefficients of either complex numbers or these numbers have complex roots. For 10 points, name these numbers that comprise the number line.

ANSWER: real [or reals; or formally real field; or real numbers; or \mathbb{R}] <Aggarwal>



PACE NSC 2017 - Round 23 - Bonuses

1. Consider a program that calculates the Fibonacci sequence by evaluating f -of- x equals f -of- x -minus-one plus f -of- x -minus-two, and setting f -of-one and f -of-two both equal to one. For 10 points each:

[10] That program calculates the Fibonacci sequence using this technique in which a program calls itself.

ANSWER: recursion [accept recursive program]

[10] Because the return address and arguments are stored in memory after each recursive call, the program may crash for large values of x since it will cause this structure to overflow.

ANSWER: the call stack

[10] A compiler might be able to optimize the program if it used this form of recursion, in which the recursive call is made after all other logic. Unfortunately, since the Fibonacci addition occurs after the recursion, the program does not have this property.

ANSWER: tail recursion [or tail-recursive; or any answer with the word tail] <Jose>

2. Answer the following about Roman household deities, for 10 points each.

[10] Namesake virgin priestesses guarded the sacred fire at the temple of this goddess, whose domain encompassed the home and the hearth. Her closest Greek equivalent was Hestia.

ANSWER: Vesta

[10] Members of a household were specifically required to honor the *paterfamilias*'s instance of *this* soul-like element of the divine present in every person.

ANSWER: genius [or genii]

[10] These domestic gods originated as the guardians of the pantry or storeroom, and were often worshiped in conjunction with Vesta and the similar Lares (LAH-reez).

ANSWER: Di Penates (pen-AY-teez) <Carson>

3. This woman wrote that "Not one would mind, neither bird nor tree, / If mankind perished utterly" in "There Will Come Soft Rains." For 10 points each:

[10] Name this poet who mocks those who would mourn her death in "I Shall Not Care." Her collection *Love Songs* won the very first Pulitzer special citation for poetry.

ANSWER: Sara Trevor Teasdale [or Sara Teasdale Filsinger]

[10] Teasdale was once the sweetheart of this poet famous for dramatic recitations of his own work, like "The Congo." He repeated the refrain "Are you washed in the blood of the lamb?" in "General William Booth Enters Into Heaven."

ANSWER: Vachel Lindsay [or Nicholas Vachel Lindsay]

[10] Lindsay wrote a poem in which this president "Walks at Midnight." This president's death inspired Whitman's poems "When Lilacs Last in the Dooryard Bloom'd" and "O Captain! My Captain!"

ANSWER: Abraham Lincoln <Kothari>

4. One phrase in this language in the Bible is "Eloi, Eloi, lama sabachthani?" (**ella-HEE, ella-HEE, lah-MAH shah-"Bach"-TAH-nee**), which means "My God, my God, why have you forsaken me?" For 10 points each:

[10] Name this non-Hebrew Semitic language spoken by most Jews in first-century Palestine.

ANSWER: **Aramaic**

[10] Some scholars like George Lamsa advocate the minority viewpoint that the New Testament was written originally in Aramaic, and not this language spoken in eastern parts of the Roman Empire.

ANSWER: **Koiné Greek** [accept either underlined part]

[10] George Lamsa's best known work is a translation of the Peshitta (**p'sheet-TAW**), an Aramaic version of the Bible used by this Christian denomination, whose patriarch Babai affirmed its adherence to Nestorian doctrines.

ANSWER: the **Assyrian** Church [or the **Church of the East**; or the Holy Apostolic Catholic **Assyrian** Church of the East] <Cheng>

5. Ampère's law reduces an equation governing these materials to just " $\frac{d}{\lambda^2} B$ equals B over λ^2 ", where λ is the London penetration depth. For 10 points each:

[10] Name these materials that obey the Meissner effect and have zero resistance at low temperatures.

ANSWER: **superconductors** [or word forms]

[10] The Meissner effect is somewhat analogous to this classical law which states that currents are generated in a conductor to offset any sudden change in magnetic flux, except that it applies to *any* magnetic field.

ANSWER: **Lenz's law** [prompt on **Faraday's Law of Induction**]

[10] In type II superconductors above the critical field strength, the Meissner effect breaks down, and the magnetic type of these systems form. In fluid mechanics, these systems lend their name to a quantity symbolized omega that is equal to the curl of the velocity field.

ANSWER: **vortices** [or **vortexes**; or Abrikosov **vortices**] <Silverman>

6. In 2016, this man was widely criticized for telling pensioners "there's no money, but you have to hang in there". For 10 points each:

[10] Identify this politician who was the target of widespread protests in March 2017 by people waving sneakers and rubber ducks, inspired by a video alleging his corruption posted by Alexei Navalny.

ANSWER: Dmitry **Medvedev** [or Dmitry Anatolyevich **Medvedev**]

[10] Medvedev served as President in between the terms of this current Russian President, who is rumored to be planning to fire Medvedev prior to the 2018 elections.

ANSWER: Vladimir **Putin** [or Vladimir Vladimirovich **Putin**]

[10] One consistent hobbyhorse for Medvedev has been his campaign to address this problem, also subject of an unpopular campaign by Mikhail Gorbachev. Medvedev pushed for higher prices and banned kiosk sales to reduce this problem, which as of 2009 caused half of all deaths for Russians aged 15 to 54.

ANSWER: **alcoholism** [or **alcohol abuse**; or **drunk driving**] <Bentley>

7. This general presided over the so-called "Magdeburg Wedding," a sacking of the Protestant city of Magdeburg in which roughly 75 percent of its population was killed. For 10 points each:

[10] Name this commander of the Catholic League who died trying to prevent Swedish forces from crossing the Lech River.

ANSWER: Johann Tserclaes, Graf von Tilly [accept either underlined answer; or Count von Tilly; or Count of Tilly]

[10] The Siege of Magdeburg took place during this lengthy religious conflict concluded by the Peace of Westphalia.

ANSWER: Thirty Years' War

[10] Tilly's first defeat in the war was in this September 17, 1631 battle where Gustav Karlsson Horn executed one of the first troop shifts in modern warfare. Gustavus Adolphus's troops killed some 12,000 Imperial troops at this battle in Saxony.

ANSWER: Battle of Breitenfeld <Bentley>

8. Answer the following about shipwrecks in Italian poetry, for 10 points each.

[10] A ship "laden with forgetfulness" risks wreckage between Scylla and Charybdis in a sonnet that compares this woman's eyes to "sweet stars." That poem appears in a collection of 366 poems about this woman, the *Canzoniere*.

ANSWER: Laura de Noves [or Laura de Noves]

[10] The words "it is sweet to shipwreck in such a sea" end "The Infinite," a poem by this 19th-century Italian author of "To Silvia." In 2013, an English translation of over 2,500 pages of this poet's notes were published as *Zibaldone* (dzee-ball-DOH-nay).

ANSWER: Giacomo Leopardi

[10] *Joy of Shipwrecks* is a poetry collection by Giuseppe Ungaretti, an Italian poet who led the Hermetic poetry movement in this century. The poet Filippo Marinetti authored the Futurist Manifesto in this century.

ANSWER: 20th century [or 1900s] <Brownstein>

9. This man established a "summer White House" at the State Game Lodge in South Dakota. For 10 points each:

[10] Identify this tight-lipped president who took office following the death of his predecessor, Warren G. Harding.

ANSWER: Calvin Coolidge [or John Calvin Coolidge, Jr.]

[10] Robert E. Gilbert wrote that Coolidge began suffering from severe depression following this event. This event was caused by a blister from a game of lawn tennis at the White House. A descriptive answer is acceptable.

ANSWER: the death of Calvin Coolidge's youngest son [or the death of Calvin Coolidge, Jr.; note that even though Calvin Coolidge was a Jr., his son was also called Calvin Coolidge, Jr.]

[10] In 1924, Coolidge signed into law the Snyder Act which granted citizenship to these people, who, unless they were taxed, were exempt from counting towards a state's population in Article One of the Constitution. In 1824, Secretary of War John C. Calhoun created an office concerned with these people.

ANSWER: Native Americans [or Indians; or indigenous peoples] <Bentley>

10. Answer the following about a certain bird in classical music, for 10 points each.

[10] A George Meredith poem inspired *The Lark Ascending*, a piece for violin and piano by this English composer of *Fantasia on a Theme of Thomas Tallis*.

ANSWER: Ralph **Vaughan Williams** [prompt on partial answer]

[10] "The Lark" is the title of a Joseph Haydn piece in this genre, part of a collection named for the violinist Johann Tost. Other collections of these works by Haydn include the Opus 20 "Sun" ones, the Opus 33 "Russian" ones, and the Opus 76 "Erdödy" (AIR-der-dee) ones.

ANSWER: **string quartets** [prompt on partial answer]

[10] A song called "The Lark", later transcribed for piano by Mily Balakirev (buh-LAH-kee-riff), is the tenth piece in this composer's *A Farewell to St. Petersburg*. In one of his operas, the title couple is reunited after the exposure of the kidnapping scheme carried out by Farlaf.

ANSWER: Mikhail Ivanovich **Glinka** <Carson>

11. Alfonso Caso established a chronology for this site consisting of five periods, and discovered its extensive "Tomb Seven" shrine. For 10 points each:

[10] Name this archaeological site. Hundreds of artistic figures found here termed "Danzantes" suggest that the inhabiting civilization practiced human sacrifice.

ANSWER: **Monte Albán**

[10] Monte Albán was built in this valley, where other Zapotec cities, such as the San José Mogote, were also built. It gives its name to one of the southernmost Mexican states.

ANSWER: **Oaxaca** Valley [accept **Central** Valleys]

[10] The Zapotecs at Monte Albán are known to have engaged in a form of exchange with this other Mesoamerican civilization, who are known for building massive stone heads.

ANSWER: **Olmecs** <Jose>

12. Potassium oxalate is added to cell-free protein synthesis reactions to stimulate the formation of these bonds, which are normally formed in *E. coli* by Dsb (**D-S-B**) proteins. For 10 points each:

[10] Name these covalent bonds that can be reduced *in vitro* by beta-mercaptoethanol and DTT, causing denaturation of most proteins.

ANSWER: **disulfide** bonds

[10] Molecular crowding agents like PEG are often added to cell-free reactions to simulate the high viscosity of this substance, the gel-like substance in which enzymatic reactions normally take place inside a cell.

ANSWER: **cytoplasm** [or **cytosol**]

[10] To sustain transcription and translation, cell-free reactions must be supplied with an energy source, such as this derivative of arginine, which serves as a reservoir for high-energy phosphates in the muscles and brain by interconverting with ATP.

ANSWER: **creatine** phosphate [do not accept or prompt on "creatinine"] <Silverman>

13. Answer some questions about sustainability, for 10 points each.

[10] A common way of quantifying a person's environmental impact is this measure, often expressed as the amount of land it would take to sustain resource use. This term can be used to describe the carbon emissions caused by a person's activities.

ANSWER: ecological **footprint** [or environmental **footprint**; accept answers like carbon **footprint** or water **footprint**]

[10] The environmental impact of producing a good or service can be quantified by this technique, which measures all impacts from extracting raw materials, to processing and distribution, to disposal.

ANSWER: **life-cycle** analysis [or **life-cycle** assessment; or **LCA**]

[10] Many life-cycle analyses attempt to determine impacts caused by release of these gases, which include methane and carbon dioxide. Because these gases absorb and emit thermal infrared radiation, they trap heat and cause climate change.

ANSWER: **greenhouse** gases <Kothari>

14. A poem about this man notes that he had "small Latin and less Greek," but compares him to "thund'ring Aeschylus, / Euripides and Sophocles." For 10 points each:

[10] Name this poet who was described as "not of an age but for all time!" in a poem dedicated to his memory.

ANSWER: William **Shakespeare**

[10] That eulogy for Shakespeare was written by this contemporary, who wrote "Drink to me only with thine eyes" in "To Celia." He also wrote *Volpone* and *The Alchemist*.

ANSWER: Ben **Jonson**

[10] Jonson wrote his eulogy and a shorter poem for this early complete edition of Shakespeare's plays, which was printed in a format in which pages were only folded once.

ANSWER: **First Folio** [or **Mr. William Shakespeare's Comedies, Histories, & Tragedies**] <Kothari>

15. The second manifesto of this movement claimed that its most emblematic action would be "dashing down into the street, pistol in hand, and firing blindly, as fast as you can pull the trigger, into the crowd". For 10 points each:

[10] Identify this movement, exemplified by works such as Méret Oppenheim's *Object*, which consists of a teacup, a saucer, and a teaspoon, all covered in fur.

ANSWER: **surrealism** [or **surrealists**]

[10] A birdlike creature named Loplop appears in many paintings by this German surrealist, who attached a red wooden gate to his painting *Two Children Are Threatened by a Nightingale*.

ANSWER: Max **Ernst**

[10] Ernst made illustrations for some of the works of this author, whose *Alice's Adventures in Wonderland* was wonderfully illustrated by John Tenniel.

ANSWER: Lewis **Carroll** [or Charles Lutwidge **Dodgson**] <Bentley>

16. The members of this organization refused to recognize blockades placed on undefended ports. For 10 points each:

[10] Identify this alliance between countries such as Spain, Sweden and Austria. It was the brainchild of Catherine the Great and placed economic pressure on Great Britain.

ANSWER: The First **League of Armed Neutrality**

[10] The League of Armed Neutrality was used by Russia to protect shipping during this conflict. French forces under the Comte de Rochambeau helped win the Battle of Yorktown in this war.

ANSWER: American **Revolutionary** War [or War of **American Independence**]

[10] While the ineffective Second League of Armed Neutrality was in place, the Russians attempted to invade this British colony. British interests in this colony were largely secured through a 1757 victory for Robert Clive.

ANSWER: **India** [or British **Raj**; or **Indian Empire**] <Bentley>

17. Answer the following about customs officials taking a dim view of avant garde art, for 10 points each.

[10] One work in this 1920s series of sculptures, now in the collection of the Seattle Art Museum, was subject to a 40-percent import tariff because it did not meet the definition of being a "reproduction by carving or casting, imitations of natural objects, chiefly the human form".

ANSWER: **Bird in Space** [or **L'Oiseau dans l'espace**]

[10] In 1965, some of this artist's *Brillo Soap Pads Box* sculptures were held up by Canadian customs because the director of the Canadian National Gallery refused to deem them art. Similar works by this artist include his *Campbell's Soup Cans* series.

ANSWER: Andy **Warhol** [or Andrew **Warhola**]

[10] In the case of *U.S. v. Perry*, the court ruled that works in this medium were not fine art and thus subject to tax. Louis Comfort Tiffany developed the Favrite version of this medium, which was popular among Art Nouveau artists.

ANSWER: **stained glass** [prompt on glass] <Bentley>

18. Answer some questions about Richard Rorty's sustained engagement with another thinker's works, for 10 points each:

[10] Rorty takes this philosopher's critique of logocentrism as a claim that philosophy is just another kind of writing in an essay that comments on this man's books *Of Grammatology* and *Writing and Difference*.

ANSWER: Jacques **Derrida**

[10] Rorty discusses how Derrida's *The Postcard* displays this attitude in a book titled for contingency, solidarity, and it. Søren Kierkegaard's doctoral thesis probed Socrates's use of this attitude.

ANSWER: **irony**

[10] In *Contingency, Irony, and Solidarity*, Rorty compared Derrida's critique of Heidegger to Heidegger's critique of this philosopher, who wrote that "God is dead" in *The Gay Science*.

ANSWER: Friedrich Wilhelm **Nietzsche** <Kothari>

19. Edmund Gosse recounts how he abandoned his father's religious fundamentalism in favor of this theory in *Father and Son*. For 10 points each:

[10] Name this theory, which Victorians sometimes described using Tennyson's phrase "nature, red in tooth and claw" after it was publicized in *The Origin of Species*.

ANSWER: **evolution** [or natural **selection**; or **Darwinism**]

[10] The theory of evolution is supported in Charles Kingsley's 1863 children's novel *The Water-Babies*, which follows a boy with this job named Tom. William Blake described a boy of this profession as a "little black thing among the snow, crying 'weep! weep!'"

ANSWER: **chimney-sweepers**

[10] This Victorian author used evolution to argue that machines could develop consciousness in "Darwin and the Machines," which was published as part of his novel about Higgs's encounter with a people that worships the goddess Ydgrun.

ANSWER: Samuel **Butler** <Brownstein>

20. This substance is produced through pedogenesis. For 10 points each:

[10] Name this mixture of dirt, organic matter, and water that is used to grow plants. Specific examples of this substance include loam and brunizem.

ANSWER: **soil**

[10] Soil is considered to be the portion of this material that can support life. This term refers to any form of dust that is produced by the weathering of pre-existing material, and it is often used to describe the dust on the Moon.

ANSWER: **regolith** [accept lunar **regolith**]

[10] Soil science is often divided into two disciplines: pedology, which is the study of soil as a natural system, and this other branch, in which soil is studied in its ecological context.

ANSWER: **edaphology** <Jose>

21. Because this post-translational modification must be done to monoclonal antibodies for them to show activity, they cannot be made recombinantly in bacteria. For 10 points each:

[10] Name this protein modification that takes place on oxygen residues in the Golgi apparatus and nitrogen residues in the rough ER.

ANSWER: **glycosylation** [prompt on addition of sugars or similar answers]

[10] Partially glycosylated proteins are transported between the Golgi and rough ER encapsulated in one of these small liposomal structures that bud off from membranes and transport molecules around cells.

ANSWER: **vesicles**

[10] George Emil Palade (**JOR-jay ay-MEEL pah-LAH-day**) figured out the mechanism of the secretory system using a pulse-chase experiment, in which amino acids modified in this way are first incorporated into a cell, then washed out. Melvin Calvin discovered the mechanism of photosynthesis using CO₂ modified in this way.

ANSWER: **radiolabelled** [or **radioactively** labelled; or **isotopically** labelled; or they are **radioactive**; or **C-14 labelled**; or **H-3 labelled**; or **tritium labelled**; or obvious equivalents] <Silverman>