

National Academic Bee – Finals

Regulation Tossups

(1) **In four-dimensional theories, these particles are described as dyons with zero electric charge. Dirac strings would connect two of these particles, and grand unified theories claim these particles would not exist due to predicted topological defects. The fact that (+) these particles do not exist implies the fact that a certain field has zero divergence, per Gauss's law for (*) magnetism.** For the points, name these particles that could enable a magnet to act as just a north or south pole.

ANSWER: magnetic **monopole** (accept Dirac **monopole**)

(2) **This artist unsuccessfully experimented with found objects for the circus-themed exhibition *The Clown as the Center of his World*. The *Black Zag* series by this artist used Formica, though this artist is more closely associated with a material used for the sculpture series *Dream Houses*. (+) The known work of this artist consists of 60 compartments made of pre-fabricated wooden boxes and is painted entirely black. (*)** For the points, identify this sculptor of large wall pieces such as *Sky Cathedral*.

ANSWER: Louise **Nevelson**

(3) **Artifacts from a journey by this person have been discovered on Mogador Island near Essaouira. One *periplus* attributed to this person includes a description of a mountain speculated to be Mount Cameroon, where this person discovered an island populated by a group of people dubbed the (+) "gorillai." This person, who led a journey from the Straits of Gibraltar to at least as far as Senegal, was the son of Hamilcar the First. (*)** For the points, name this Carthaginian explorer and king known for voyaging down coastal Africa in the fifth century B.C.E.

ANSWER: **Hanno** the Navigator (accept **Hannon**)

(4) **These organelles function by creating osmotic pressure from moving calcium ions into the cytoplasm and filling the cell with water. These organelles can only be activated once, at which point they release a small barb lined with neurotoxins. The activation of these organelles is coordinated by neurons and "battery cells" (+) in hydrozoans, such as the Portuguese man-o-war, and immunity to these organelles evolved in clownfish. (*)** For the points, name these stinging organelles found within cnidarian cnidocyte cells.

ANSWER: **nematocysts** (accept **cnidocysts**; accept **cnidae**)

(5) **This author's admiration for Friedrich Nietzsche likely influenced the mention of an "abyss of darkness" in a set of spiritual exercises titled *The Saviors of God*. This author wrote two children's novels, *Alexander the Great* and *At the Palaces of Knossos*. This author imagined (+) Mary Magdalene as the wife of the title character of one work, and another title character created by this author seeks to open an abandoned lignite mine in (*) Crete.** For the points, identify this Greek author of *The Last Temptation of Christ* and *Zorba the Greek*.

ANSWER: Nikos **Kazantzakis**

(6) **The Shark Island concentration camp was built during this event, many victims of which fled to Bechuanaland. Hendrik Witbooi and a Paramount Chief rebelled against the colonial power that perpetrated this event under the rule of Lothar von Trotha. This event is often considered the first (+) genocide of the 20th century, and this event was carried out by imperial soldiers called *schutztruppe*. (*)** For the points, name this 1904 to 1908 genocide that was perpetrated by the German Empire in modern-day Namibia.

ANSWER: **Herero** and Nama(qua) genocide (accept **Namibian** Genocide before mentioned; accept **Ovaharero**)

(7) **In the essay “Where Am I?” this thinker discussed the problem of identity with a version of the brain in a vat thought experiment. That essay was included in this thinker’s multidisciplinary book *Brainstorms*. In another book, this thinker proposed the multiple drafts model (+) of the title concept, and this thinker referred to evolution by natural selection as a “universal acid” that would eventually affect all fields. (*)** For the points, identify this recently-deceased philosopher who wrote *Consciousness Explained* and *Darwin’s Dangerous Idea*.

ANSWER: Daniel **Dennett** (or Daniel Clement **Dennett** the Third)

(8) **One novel titled for this substance ends as a character with three moles on his side tells the protagonist that he will see him again before dying. That novel titled for this substance is the first of the *Sea of Fertility* tetralogy. Another novel titled for this substance ends as a silk worm (+) warehouse burns down, while Shimamura feels “the Milky Way [flow] down inside him with a roar.” (*)** For the points, name this substance, which appears alongside the word *Spring* in a novel by Yukio Mishima and the word *Country* in a novel by Yasunari Kawabata.

ANSWER: **snow** (accept *Spring* **Snow**; accept **Snow** *Country*)

(9) **After the death of Etienne du Castel, this author became a protegee of Queen Isabeau of Bavaria. This author’s work “Le Dit de la Rose” was written in response to a popular misogynistic romance poem (+) of the day. This author created an imaginary location built by, and for, women in the 1405 work *The Book of the City of Ladies*. (*)** For the points name this medieval Italian-French poet and court writer for King Charles the Sixth of France, perhaps the first woman to write professionally.

ANSWER: Christine **de Pizan** (accept Christine **de Pisan**; accept Cristina **da Pizzano**; prompt on partial answers)

(10) **An intruder state can arise when using this technique, and an expansion of the time evolution operator in the interaction picture via this technique creates the Dyson series. In this technique, an initial time-independent value adds the quantity lambda times a Hermitian operator, and, in one context, (+) this technique considers a zeroth-order equation arising from an expansion of the Schrodinger equation. (*)** For the points, identify this technique that continuously corrects an approximate solution, such as by adding terms to find the Hamiltonian.

ANSWER: **perturbation** (accept **perturbation** theory; accept regular **perturbation** theory; accept Rayleigh-Schrodinger **perturbation** theory; accept **perturb**ative evaluation)

(11) **The NBC Opera Theatre presented an opera by this composer centering on Sam and Dinah and titled for the fictional film *Trouble in Tahiti*. In an operetta by this composer, a character sings, "We're neither pure, nor wise, nor good," in the aria "Make Our (+) Garden Grow."** That operetta by this composer, whose overture quotes the aria "Glitter and Be Gay," opens with the aria "The Best of All Possible Worlds," sung by Dr. Pangloss. (*) For the points, name this American composer of *Candide* and longtime director of the New York Philharmonic orchestra.

ANSWER: Leonard **Bernstein** (or Louis **Bernstein**)

(12) **Frederick Law Olmstead was the first executive secretary of this organization, which was modeled on a similarly named British organization from the Crimean War. Supporters of this organization, which was private but also established by federal law, launched namesake fairs (+) to raise funds, and members of this organization included Louisa May Alcott and Dorothea Dix.** (*) For the points, name this organization, which provided medical assistance to sick and wounded Union soldiers during the U.S. Civil War.

ANSWER: United States **Sanitary Commission** (accept **Sanitary Fairs**)

(13) **By studying a thin film of this compound, HP Labs announced experimental evidence for the memristor. Photocatalytic properties of this compound are the subject of the Honda-Fujishima effect. Materials with a high content of this compound can be created from ilmenite (+) in the Becher process, and the production of pure forms of this compound is the goal of the chloride process.** (*) For the points, identify this mineral with a high refractive index that occurs most commonly, and in its most stable form, as rutile.

ANSWER: **titanium dioxide** (or **TiO₂**; accept **titanium four dioxide**; accept **titania**; accept **titanium white**; accept **pigment white six**; accept **PW6**; accept **CI 77891**; accept **rutile** before mentioned; do not accept "titanium")

(14) **In one work, this poet instructs the ignorant Perses on how to run a farm and recounts the Gold, Silver, Bronze, and Iron ages of humanity. This poet wrote in the Ionian dialect, despite the fact that this poet was born in Aeolia. (+) This poet described the first primordial deity, Chaos, in a poem that tells of the overthrow of Kronos by Uranus, as well as the overthrow of Uranus by Zeus.** (*) For the points, name this ancient Greek poet, the author of *Theogony* and *Works and Days*.

ANSWER: **Hesiod** (or **Hēsíodos**)

(15) **Pope Pius the Fifteenth considered banning cardinals from playing this game because of its popularity, and Plinio Designori criticized this game for being "cut off from the world."** The **Magister Ludi (+)** is the highest-ranked player and travels to Castalia for this game, which was mastered in one novel by Joseph Knecht. As it is depicted, this game is an apparent blend of the *I Ching* and western math and music. (*) For the points, name this fictional game that titles a 1943 novel by Hermann Hesse.

ANSWER: **glass bead** game (accept *The **Glass Bead Game***)

(16) **The phrase for this initiative was first used at a speech at Ohio University, and this initiative is often viewed as an evolution of the "New Frontier." Thomas Sowell argued that this initiative was responsible for the destruction of the Black nuclear family. (+)** and this initiative involved the creation of the Head Start program and the Job Corps. Other programs created under this initiative include (*) Food Stamps and Medicaid, as part of the related "war on poverty." For the points, name this series of domestic welfare programs under Lyndon B. Johnson.

ANSWER: **Great Society**

(17) **This leader issued the *Casti connubii*, which forbade contraception. Eugenio Pacelli represented this leader while negotiating a treaty with Franz von Papen, and this leader wrote a text called *Mit brennender Sorge*, which called out the "myth of race and blood" (+)** and violations of the *Reichskonkordat*. The Roman question was resolved under this leader, who served as the first sovereign of Vatican City after negotiating the Lateran Treaty (*) with Benito Mussolini. For the point, name this pope who served from 1922 to 1939.

ANSWER: Pope **Pius the Eleventh** (accept Ambrogio Damiano Achille **Ratti**)

(18) **The centrosymmetry of these structures is classified as either "gerade" [[geh-RAH-duh]] or "ungerade" [[un-geh-RAH-duh]]. Frontier examples of these structures include the LUMO, which is formed from a "linear combination" of the simpler counterparts of these structures using the LCAO (+) method. The high-energy, anti-bonding types of these structures can be labelled as either pi-star or sigma-star on their namesake (*) diagrams. For the points, name these regions of probability density for a negative particle surrounding bonded atoms.**

ANSWER: **molecular orbitals** (or **MOs**; accept **molecular orbital** theory; accept **molecular orbital** diagram or **MO** diagram; prompt on "orbitals;" prompt on "wavefunctions;" do not accept "atomic orbitals")

(19) **This composer died in the midst of writing the opera *Lucrezia*, which was completed posthumously by Elsa Olivieri-Sangiaco. This composer's *Violin Sonata in B minor* was premiered in Naples by violinist Arrigo Serato, and this composer arranged works by Gioachino Rossini (+) in *La Boutique fantasque* for the Ballets Russes. A trio of works by this composer describes the festivals and fountains (*) of an ancient city, where a group of trees march. For the points, name this Italian composer of *The Pines of Rome*.**

ANSWER: Ottorino **Respighi** [[reh-SPEE-ghee]]

(20) **This person is thought to be the primary author of the Judiciary Act of 1789, which established the federal court system and the position of attorney general. As chief justice of the Supreme Court, this person is identified with efforts to end the practice of *seriatim*, in which each justice wrote an individual opinion (+) on every case. With William Vans Murray and William Richardson Davie, this man signed the Convention of 1800 to end the Quasi-War with France. (*)** For the points, identify this framer of the U.S. Constitution from Connecticut.

ANSWER: Oliver **Ellsworth**

(21) **Due to low exponent values, this algorithm is vulnerable to Coppersmith's attack, as well as Wiener's attack. This algorithm, which can avoid attacks by using random padding values, involves calculating the product of two large prime numbers. (+) computing the value of Carmichael's totient function on the product, and then finding a secret modular multiplicative inverse. (*)** For the points, name this public key cryptography algorithm that bears the initials of three computer scientists.

ANSWER: **RSA** (or **Rivest-Shamir-Adleman**)

(22) **The second-deadliest Ebola outbreak occurred in this region in 2018. Doctor Denis Mukwege was awarded the Nobel Peace Prize in 2018 for working in this region to treat victims of sexual violence. The March 23 Movement and Mai-Mai militias are active in this region, which is home to the cities of (+) Bukavu and Goma, and this region centers around the largest body of water capable of limnic eruptions. (*)** For the points, name this region that surrounds an eponymous lake and is split between the Democratic Republic of Congo and Rwanda.

ANSWER: **Kivu**

(23) **Values measured from a form of this effect relate anisotropic and isotropic components of a tensor and appear in a graph as a semicircle. In ionized gases, this effect is associated with a parameter equal to the "product of magnetic field and elementary charge, divided by electron mass and electron-heavy particle collision frequency." (+) In this effect, electric current flowing through a magnetic field causes charge to build up on one side of a conductor. (*)** For the points, identify this electromagnetic effect that creates a voltage difference.

ANSWER: **Hall** effect (accept **Hall** parameter; accept **Hall** voltage; accept quantum **Hall** effect)

(24) **One proponent of this school of thought wrote a treatise titled *Human Action*. Friedrich von Wieser from this school was credited with developing the theory of marginal utility. Carl Menger is considered the founder of this school (+) of thought, which was involved in the *methodenstreit* dispute with the German historical school of economics. (*)** For the points, identify this individualist school of economic thought, whose followers included Ludwig von Mises and Friedrich Hayek, thinkers from a namesake European country.

ANSWER: **Austrian** school of economics

(25) **This author used photos taken by the Farm Security Administration during the Great Depression for the work *Twelve Million Black Voices*. This author's essay "The Ethics of Living Jim Crow" is included in the collection *Uncle Tom's Children*. (+) In a novel by this author, a chauffeur is defended by the Communist lawyer Boris Max after he kills his girlfriend Bessie and accidentally suffocates (*) Mary Dalton. For the points, name this author who wrote about Bigger Thomas in *Native Son*.**

ANSWER: Richard **Wright** (or Richard Nathaniel **Wright**)

(26) **This emperor wrote the satirical essay "Misopogon," which attacked beards. This emperor's attempts to rebuild the Jewish temple in Jerusalem were thwarted by a pair of earthquakes. This emperor was killed by a spear under mysterious circumstances at the Battle of Samarra. (+)** and this emperor's apocryphal dying words were "You have won, Galilean," in reference to an expected resurgence of Christianity. (*) For the points, name this final Roman emperor to promote Hellenism as the state religion.

ANSWER: **Julian** (or Flavius Claudius **Julianus**; or **Julian** the Apostate; or **Julian** the Philosopher)

(27) **This practice is named after the person who began applying it in the 1929 film Show Boat, and, in the same year, vocalized the first Tarzan yell. This practice can enhance the effect of on-ground or air traffic during field recording using objects such as thunder sheets. (+)** and this practice often involves replicating common occurrences such as broken glass and footsteps. (*) For the points, identify this practice in which professionals recreate noises for the soundscape of a film or TV production.

ANSWER: **Foley** (accept **Foley** arts; accept **Foley** artist)

(28) **Two central characters in this novel hold off an attack during the Siege of the Roundhouse. A character known as the "Red Fox" befriends the protagonist of this novel in Appin before being killed by a sniper. A real-life event inspired the killing of Colin Roy Campbell (+) in this novel, and another historical character in this novel, Allan Breck Stuart, is a Jacobite soldier from Scotland. (*)** For the points, identify this Robert Louis Stevenson novel about the abduction of David Balfour.

ANSWER: **Kidnapped**

(29) **This field was combined with graphology by Belgian education theorist Paul Bouts to create the field of psychognomy. Italian criminologist Cesare Lombroso was influenced by this field and put forward the claim that (+) criminals could be identified preemptively through atavistic traits measured with tools such as calipers. (*)** For the points, name this pseudoscientific field founded by Franz Joseph Gall, which infers personal characteristics from the bumps and shape of the skull.

ANSWER: **phrenology** (accept **psychognomy** before mentioned)

(30) **This city's northern coastline is situated on Tarout Bay, and this city's economy is reliant on the nearby Ghawar Field. This city forms an urban area with Khobar and Dhahran, the latter of which contains the headquarters of Aramco. This city is served by the world's largest airport by land area. (+)** King Fahd International Airport, and this city, which serves as the capital of Eastern Province, is the largest port on the Persian Gulf outside the United Arab Emirates. (*) For the points, name this most-populated city of eastern Saudi Arabia.

ANSWER: **Dammam**

(31) **It's not a type of tree, but one form of this plant species in California was declared the world's largest blossoming plant in 1990 and now spans an acre and weighs 250 tons. This plant species with poisonous seeds has a floribunda variety that twines clockwise. (+)** and this non-tea plant species also has a sinensis variety that twines counter-clockwise. Glycine is another name given to, (*) For the points, what flowering vine that is native to East Asia and has white to light purple hanging blossoms?

ANSWER: **wisteria** (accept *Wisteria floribunda*; accept Japanese **wisteria**; accept *Wisteria sinensis*; accept Chinese **wisteria**; accept **glycine** before mentioned)

(32) **This mathematician used a sexagesimal algorithm for division and authored a commentary on Apollonius of Perga's work on conic sections. This mathematician edited Book Three of Ptolemy's *Almagest*, and this mathematician improved methods of long division used in astronomy. (+)** Following rumors that the relationship between Orestes and Cyril had been sabotaged, this mathematician was killed by a group led by a lector named Peter. (*) For the points, identify this mathematician from Alexandria who was murdered by a Christian mob.

ANSWER: **Hypatia** of Alexandria

(33) **During a feud, this philosopher called an economist "the Ariel Sharon of higher education." A dispute with Larry Summers caused this philosopher to leave for Princeton after a tenure at Harvard. This philosopher, who collaborated with Henry Louis Gates Jr. on the books *The African-American Century* (+) and *The Future of the Race*, selected Melina Abdullah as running mate for a campaign in the 2024 Presidential Election. (*)** For the points, name this Black pragmatist philosopher, the author of *Race Matters*.

ANSWER: Cornel **West** (or Cornel Ronald **West**)

(34) **While in Florence, this artist often signed paintings with the surname "Lomi," much like this artist's father, Orazio. This artist wears green and leans toward the left while holding a thin paintbrush in *Self-Portrait as the Allegory of Painting*. This artist may have self-modeled the central figure of (+) *Susanna and the Elders*, and a violent attack on this artist may have inspired the bloody depiction of a beheaded Assyrian general. (*)** For the points, name this woman, the painter of *Judith Slaying Holofernes*.

ANSWER: Artemisia **Gentileschi** (prompt on "Artemisia Lomi")

(35) **One of the sons of this figure became the namesake of the Illyrians. In a work by Euripides, a prophecy given to this figure claimed he and his wife would turn into snakes. Concordia is the Roman counterpart to the wife of this figure. (+)** Harmonia, who owned a cursed necklace. Herodotus claims that the Phoenician alphabet was introduced to the Greeks by this figure, who names a non-Athenian acropolis (*) in a city that he led. For the points, name this legendary founder of Thebes.

ANSWER: **Cadmus** (or **Kádmos**)

Extra Questions

(1) **With Richard Nixon, this person reached an agreement called the "Treaty of Fifth Avenue" to moderate the 1960 Republican Party platform. This person led a faction of Republicans that were known for their liberal views, sometimes called the Eastern Establishment. (+)** This person was governor of New York throughout the 1960s, and this politician was the second person to be confirmed by the Senate as (*) vice-president. For the points, name this vice-president under Gerald Ford, the grandson of the founder of Standard Oil.

ANSWER: Nelson **Rockefeller** (prompt on "Rockefeller" alone)

(2) **A composer from this country wrote "I saw my Lady weep" and other slow, sorrowful songs, including "Flow my tears." A 40-part motet from this country divided into eight choirs is titled for the Latin for "Hope in any other." *Spem in Alium*. This country's Renaissance-era Virginal (+) school included the *Fitzwilliam Virginal Book*, and a Baroque composer from this country wrote "When I am laid in earth" for the opera (*) *Dido and Aeneas*.** For the points, identify this home of composers Thomas Tallis and Henry Purcell.

ANSWER: **England** (prompt on "United Kingdom" or "Great Britain")

(3) **A diaspora from this country is a prominent part of Brooklyn's Greenpoint neighborhood. This country is the namesake of a town in Maine that produces an eponymous brand of spring water. Chicago is also known for its diaspora community from this country, and a (+) "Greater Voivodeship" named for this country includes Poznań. One general from this country is the namesake of the highest mountain in Australia. (*)** For the points, name this country from which Tadeusz Kościuszko hailed.

ANSWER: Republic of **Poland** (accept Rzeczpospolita **Polska**; accept **Poland** Spring; accept Greater **Poland** Voivodeship)