

National Academic Bee – Round 4

Regulation Tossups

(1) This leader's wife, Anita, died while fleeing after the failed defense of the Roman Republic. Though a Republican, this person supported a monarch from a cadet branch of the House of Savoy for the sake of unity. Victor Emmanuel the Second was bolstered by this person, whose forces were known as the "Redshirts" and conquered Sicily and Naples during the Expedition of the Thousand. For the point, name this Italian nationalist hero who played a key role in the Risorgimento.

ANSWER: Giuseppe **Garibaldi** (or Giuseppe Maria **Garibaldi**)

(2) This author wrote "we thought it was the Judgement-day" in a poem describing "That night your great guns, unawares/Shook all our coffins as we lay." "A voice arose among the bleak twigs overhead" in another poem by this author, whose title creature "had chosen thus to fling his soul/upon the growing gloom." This poet of "Channel Firing" described the "strings of broken lyres" and the "weakening of day" in a poem that opens "I leant upon a coppice gate." For the point, identify this British poet of "The Darkling Thrush" as well as novels such as *Jude the Obscure* and *Tess of the D'Urbervilles*.

ANSWER: Thomas **Hardy**

(3) These substances can be "stirred" with a laser, producing quantized vortices [[VOR-tih-seez]] with a single-valued order parameter. These substances allow microscopic wavefunction inference to be observed macroscopically because a large percentage of a certain type of particle occupies the lowest quantum state available. The first of these substances was created by Eric Cornell and Carl Wieman in 1995 using a supercooled vapor of rubidium atoms. For the point, identify this state of matter named for a pair of physicists.

ANSWER: **Bose-Einstein condensate** (or **BEC**)

(4) A painting by this artist, which is displayed in the House of Representatives chamber, depicts the entrance to San Francisco Bay as a symbol of Manifest Destiny. A man with a drum falls on his back near the title general in a painting by this artist depicting the Battle of Monmouth. In a painting by this artist of *Westward the Course of Empire Takes Its Way*, James Monroe accompanies a Founding Father in a rowboat. For the point, name this German-born artist of *Washington Crossing the Delaware*.

ANSWER: Emanuel **Leutze** [[LOYT-zuh]] (or Emanuel Gottlieb **Leutze**)

(5) Non-initiated members of this faith are called “the Ignorant,” which is distinguished from the “Knowledgeable Initiates.” This religion holds that al-Khidr is a reincarnation of Elijah, and the founder of this religion claimed that the Fatimid Caliph al-Hakim was a living embodiment of Allah. This religion’s primary sacred texts are the Epistles of Wisdom, and this religion’s most prominent symbol is a five-pointed, multicolor star. For the point, name this syncretic religion, an offshoot of Islam primarily practiced in Syria and Lebanon.

ANSWER: **Druze** (or **darzī**; or **durzī**; or **durūz**; accept al-**Muwahhidūn**; prompt on “Islam” or “Muslim” before mentioned)

(6) This phenomenon is present in coordination complexes, in which this phenomenon is often called “dipolar.” This phenomenon can be illustrated using Lewis dot structures, and this phenomenon is also responsible for the formation of network solids such as diamonds. This phenomenon involves the sharing of electrons, as exemplified in methane and water. For the point, name this type of bonding, which occurs between nonmetals and is contrasted with ionic bonds.

ANSWER: **covalent bonding** (accept **covalent** alone after “bonding” is mentioned)

(7) In a short story by this author, Kuno delivers the title phrase in regards to a technology that helps the population live under the Earth’s surface. This author of “The Machine Stops,” described the marriage of Lucy and George after the two characters agree to swap hotel rooms in Florence. In another novel by this author, Adela Quested is attacked in the Marabar Caves and accuses the Muslim Dr. Aziz. For the point, name this English author of *A Room with a View* and *A Passage to India*.

ANSWER: E.M. **Forster** (or Edward Morgan **Forster**)

(8) It’s not the MoMA, but this museum is home to Vincent van Gogh’s *Starry Night Over the Rhône*. The painting *A Burial at Ornans* is among the works by Gustave Courbet that are housed in this museum, which is linked by bridge to the Tuileries Garden. This museum is home to the greatest number of Impressionist artworks in the world, and the original site of this museum was constructed from 1898 to 1900 in the Beaux-Arts style. For the point, name this Paris art museum housed in a former train station.

ANSWER: Musée d’**Orsay** (accept **Orsay** Museum)

(9) The *Arthashastra* was written during the reign of this ruler by the court adviser Chanakya. According to legend, this ruler died by ritual starvation, or *Sallekana*, after converting to Jainism. To establish peace with the Seleucids, this ruler married Berenice, the daughter of Seleucus the First Nicator. The conquest of the Nanda empire paved the way for this ruler to become the first to preside over a mostly unified India. For the point, name this founder of the Mauryan Empire.

ANSWER: **Chandragupta** Maurya (or **Candagutta** Moriya; or **Candragupta** Maurya)

(10) Similarity between examples of these structures is characterized by zygoty. Maternal and paternal versions of these structures are placed on the edges of a diagram called a Punnett square. The frequency of these structures changes due to the genetic drift effect, and recessive versions of these structures are given lowercase designations, while dominant ones receive uppercase designations. For the point, name these variant sequences of DNA nucleotides, which can influence traits like eye color.

ANSWER: **alleles** (or **allelomorph**; accept **allele** frequency; accept recessive **alleles**; accept dominant **alleles**; prompt on "genes")

(11) A young boy calls a man's mother a "polecat" before jumping out of a car in a story by this author titled for a slogan about careful driving. This author described a woman who attends classes at the YMCA, but refuses to ride an integrated bus after being beaten for giving a child a penny. In another story by this author, the cat Pitty Sing causes a car crash that results in a fatal encounter with The Misfit. For the point, identify this author of Southern Gothic stories such as "A Good Man is Hard to Find."

ANSWER: Flannery **O'Connor** (or Mary Flannery **O'Connor**)

(12) George Dawe completed a set of 329 portraits of generals for this residence and its Military Gallery. Carlo Zucci helped design the interior of the Grand Church of this residence, which was attacked in a scene from a film subtitled *Ten Days That Shook the World*. The precincts of this residence are now home to the Hermitage Museum, and, for nearly 200 years, this was the official residence of the Romanovs. For the point, name this palace in St. Petersburg that is named for a season.

ANSWER: **Winter Palace**

(13) One king of this city named Baal the First was a vassal of Esarhaddon. Another king of this city named Hiram the First was mentioned in the Bible and is said to have provided cedar logs to build Solomon's temple. This city was the home of Europa as well as the legendary founder of Carthage, Dido, and Alexander the Great besieged this city by ordering the construction of a causeway to connect this city to the mainland. For the point, name this ancient Phoenician city formerly situated on an island in modern-day southern Lebanon.

ANSWER: **Tyre** (accept pronunciations like ["sour"] or ["SAUR"])

(14) This technique originally utilized the Klenow fragment before it was replaced by an enzyme that was isolated from the microorganism *Thermus aquaticus*. In 1993, Kary Mullis won the Nobel Prize in Chemistry for developing this technique, which routinely utilizes the thermostable enzyme, partially known as Taq, and stages of this technique include denaturation, annealing, and extending. For the point, identify this laboratory technique to rapidly copy numerous specific segments of DNA.

ANSWER: **polymerase chain reaction** (or **PCR**)

(15) Rene Magritte claimed these objects solved one of the main “painterly problems” by uniting disparate spaces and worlds. In Egyptian tombs, funerary cones were placed above these objects to symbolize access to the afterlife. A contest to create one of these objects was won with a 28-panel design that later influenced Auguste Rodin. For the point, name this type of object that Lorenzo Ghiberti designed for the Florence Baptistery, which directly inspired *The Gates of Hell*.

ANSWER: **door** (or **doorway**; accept **portal**)

(16) One event involving this ruler began after financiers like Seneca the Younger called in their loans. This ruler led one event after two daughters of Prasutagus were assaulted, despite their father having made Nero a beneficiary of his will. This ruler was ultimately defeated at the Battle of Watling Street after laying waste to Camulodunum and Londinium. For the point, identify this leader of the Iceni, a British queen who led a major revolt against Roman rule in 60 C.E.

ANSWER: **Boudica** (or **Boadicea**)

(17) This character encourages a friend to leave following a feast and later claims the two of them "never done nothing" during an incident in which a crowd chants "cut his throat" and "spill his blood." This character's physical capabilities are frequently mocked by the phrase "sucks to your ass-mar," in reference to asthma. A conch shell shatters after Roger pushes a boulder that kills this character, who possesses an object that is used to make a fire. For the point, name this glasses-wearing character from *Lord of the Flies*.

ANSWER: **Piggy**

(18) Sandwich composite examples of these structures can be modeled by Timoshenko-Ehrenfest theory, which generalizes a theory named for Euler [["OILER"]] and Bernoulli. Minimizing drop in these structures can be done by considering the placement of supports at Airy points. Bridges can be constructed using truss structures, which consist of these structures connected at nodes, and these structures can be deflected by bending. For the point, identify these structural elements that support a load applied along an axis.

ANSWER: **beam**s (accept sandwich composite **beam**; accept Timoshenko-Ehrenfest **beam** theory; accept Euler-Bernoulli **beam** theorem; accept engineer's **beam** theory or classical **beam** theory)

(19) Robert Graves claimed that this object was a symbol of the names of Dionysus due to its association with the god Sabazios. After entering a city with an ox-cart, this object's namesake was crowned king of Phrygia, causing his son Midas to create this object and consecrate the cart at a spot where an eagle landed. According to legend, whoever could unmake this object would be destined to conquer all of Asia. For the point, name this object, which Alexander the Great legendarily cut instead of untying.

ANSWER: **Gordian knot**

(20) Cubewanos in this region are a type of object notable for a lack of orbital eccentricity, examples of which include Arrokoth and Quaoar. This region, which is also home to Gonggong and Makemake, overlaps with the scattered disc. The moon Triton was captured from this region, which is situated at a distance between 30 and 50 AUs from the Sun. For the point, name this region of the Solar System beyond Neptune, which is named for a Dutch astronomer and is home to most of the dwarf planets.

ANSWER: **Kuiper** [[KY-per]] belt (accept classical **Kuiper belt** object; accept **KBO**)

(21) The theme of Montreal's Expo 67 drew inspiration from a work by this author sometimes called *Terre des hommes*. This author's wartime experiences shaped the memoir *Wind, Sand and Stars*, and this author died near Corsica while engaging in reconnaissance missions against Germany and Vichy France. This author, the namesake of an airport in Lyon, wrote a work that features a child, a fox, and a planet full of baobabs. For the point, name this French author of *The Little Prince*.

ANSWER: Antoine de **Saint-Exupéry** (or Antoine Marie Jean-Baptiste **Roger**, vicomte de Saint-Exupéry; accept Lyon-**Saint-Exupéry** Airport)

(22) Acid rain during this period caused a "coal gap" that left no coal deposits. The first true mammals appeared during this period, and the final years of this period included the split of Pangaea into the separate regions of Laurasia and Gondwana. Dinosaurs first appeared in the latter part of this period but soon became dominant in the following period. The first and shortest period of the Mesozoic Era is, for the point, what geologic period that existed between the Permian and the Jurassic periods?

ANSWER: **Triassic** period

(23) The election of a mayor from this political party, John T. Towers, prompted Democrats, Whigs, and Free-soilers in Washington, D.C. to create a unified opposition party in 1854. This political party brought together native-born Protestants to challenge the alleged "Romanist" conspiracy of Catholics living in the United States. For the point, identify this short-lived nativist party, which supported Millard Fillmore and was named for its members' unwillingness to reveal details.

ANSWER: **Know-Nothing** Party (accept **Native American** Party; prompt on "American Party")

(24) Solutions of these constructs can be shown to be linearly independent by considering a determinant called the Wronskian. Certain cases of these constructs can be solved via separation of variables, while the inexact form of these constructs can be solved using an integration factor. Joseph Fourier's heat equation is an example of one of these equations, which include "ordinary" and "partial" forms. For the point, identify these mathematical equations, which contain an operation from calculus representing a rate of change.

ANSWER: **differential** equations (accept inexact **differential** equations; accept partial **differential** equations; accept ordinary **differential** equations)

(25) *Two answers required.* The town of Puerto Obaldía on the border of these two countries has become a migrant destination in the Guna Yala indigenous provinces. The borders of these two countries can be accessed from the city of Turbo in the Chocó Department. A densely forested area impedes road travel between these two countries in the Darien Gap, which severs the Pan-American Highway. That area in these two countries was formerly bypassed by a ferry from Colon to Cartagena. For the point, name these two countries on the border between North and South America.

ANSWER: **Panama** and **Colombia** (accept in either order; accept Republic of **Panama** or República de **Panama** for **Panama**; accept Republic of **Colombia** or República de **Colombia** for **Colombia**)

(26) *Xenopsylla cheopis* is the primary vector for this disease, which can be treated with aminoglycosides, tetracyclines, and Cipro and has a modern mortality rate of up to fifteen percent. This disease primarily targets the lymphatic system and can start when a susceptible host population in close proximity to humans outnumbers natural predators, such as cats. Infected fleas carry, for the point, what bacterial disease caused by *Yersinia pestis*, whose best-known symptom is enlarged painful lymph nodes called buboes [[BYOO-bohz]]?

ANSWER: **bubonic plague** (accept **Black Death**; prompt on "plague")

(27) This author wrote of a biological war against a Chinese superpower in the story "The Unparalleled Invasion." In a novel by this author, the city of Asgard is full of manual laborers under the fascist Oligarchy, which falls to the utopian Brotherhood of Man. This author of *The Iron Heel* set many stories, such as a novel about Judge Miller's abducted companion, Buck, during the Klondike gold rush. For the point, name this author of "To Build a Fire" and *The Call of the Wild*.

ANSWER: Jack **London** (or John Griffith **Chaney**)

(28) Massive examples of this country's flag are flown from Çamlica Hill and hung within the Anıtkabir mausoleum. An identical version of this country's flag with a sky blue coloring is used for a government-in-exile that claims the area of Xinjiang, and this country's flag is often flown alongside the flag of the Republic of Northern Cyprus. For the point, identify this country whose red flag features a crescent and moon, an emblem inherited from the Ottoman Empire.

ANSWER: Republic of **Turkey** (accept **Türkiye** Cumhuriyeti)

(29) Changes in this phenomenon were studied by Brent Dalrymple, Allan Cox, and Richard Doell. Changes in this phenomenon occur at time intervals called a polarity chron. To confirm the theory of seafloor spreading in plate tectonics and continental drift, scientists considered the reversals of this phenomenon, as recorded by the crust, in the Vine-Matthews-Morley hypothesis. Explained by dynamo theory, for the point, what phenomenon emanates from the Earth's core and interacts with solar wind?

ANSWER: Earth's **magnetic field** (or geomagnetic field)

(30) In a song by this band, the singer impersonates a doctor and asks "Hello? Is there anybody in there?" This band wrote the nine-part song "Shine On You Crazy Diamond" about former member Syd Barrett, which appears on this band's 1975 album *Wish You Were Here*. This band included the song "Comfortably Numb" on an album that repeats the line "All in all you're just another brick in the wall." David Gilmour and Roger Waters were key members of, for the point, what English rock band behind albums such as *The Dark Side of the Moon*?

ANSWER: **Pink Floyd**

(31) The Wilderness Road traversed this geographic feature, which was also the site of the Battle of Kings Mountain. The Royal Proclamation of 1763 prohibited American settlement west of this geographic feature, where many Scotch-Irish immigrants settled. The Shenandoah Valley is situated within this geographic feature, which is passed by the Erie Canal and the Cumberland Gap. Daniel Boone traversed, for the point, what mountains that prevented westward expansion during the early history of the U.S.?

ANSWER: **Appalachian** Mountains

(32) This phenomenon yields a product recorded via a code with terms including "GR" and "GS." As of 2010, the threshold for this phenomenon is two-and-a-half centimeters, beyond which this phenomenon is considered to cause damage. The solidity of this phenomenon is what differentiates it from similar events such as graupel, which is composed of surface ice. Often confused with sleet, for the point, what weather phenomenon is a type of precipitation consisting of ice crystals called "stones"?

ANSWER: **hail** (or **hail**stones)

(33) A composer from this country frequently titles pieces using all caps, such as the orchestral works *AIÐN* and *CATAMORPHOSIS*. Composer Jón Leifs depicted this country's natural sites in pieces including *Songs of Thorgerdur* and *Dettifoss*. A composer from this country wrote the score for the miniseries *Chernobyl* and the film *Joker*. For the point, identify this country, the home of film composers Jóhann Jóhannsson and Hildur Guðnadóttir, both of whom were born in Reykjavik.

ANSWER: **Iceland** (or **Ísland**)

(34) Secret police in this country used a form of execution that was known in German as "Nackenschuss," and that police force in this country used "Black Marias" to transport prisoners. This country's first secret police was led by "Iron Felix" and was known as the Cheka, and this country's NKVD ministry was headed by Lavrentiy Beria and carried out the Great Purge. The Gulag system was operated by, for the point, what communist nation that was led by Joseph Stalin?

ANSWER: **Soviet Union** (or **USSR**; or **Union of Soviet Socialist Republics**; accept Soyuz **Sovyetskikh** Sotsialisticheskikh Respublik; do not accept "Russia" or "Russian Federation")

(35) This U.S. state's Henry Hub is known as the site where natural gas prices in the U.S. are set, and that site lies just west of New Iberia. This state's Lake Charles metropolitan area is a gambling hub known for resorts such as L'Auberge du Lac and Delta Downs. This state, where the McIlhenny Company makes Tabasco sauce, hosts the vast majority of the world's crawfish production. For the point, name this U.S. state, where the largest airport is named for jazz musician Louis Armstrong.

ANSWER: **Louisiana**

Extra Question

(1) Parameters that characterize the rotational properties of this formation are called Oort constants. The center of this formation contains a supermassive black hole called Sagittarius A-Star, which is obscured from Earth by a dark band called the Great Rift. The Magellanic Clouds orbit this formation, which is predicted to collide with the Andromeda galaxy in roughly four and a half billion years. For the point, name this galaxy that contains the Solar System.

ANSWER: **Milky Way**