

# National Academic Bowl – Finals (ES)

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## First Quarter

(1) Twenty-seven of the 54 registers at the bottom of this object survive fully, with the rest being affected by a diagonal break. This object was discovered during the rebuilding of a fort overseen by Pierre-François Bouchard. An announcement regarding this object was made in Paris in 1822 by Jean-François Champollion. Made of granodiorite, it consists of three version that were published in 196 BCE in Memphis. For ten points, name this stele containing both Ancient Egyptian and Greek inscriptions.

ANSWER: **Rosetta Stone**

(2) The Pillow Book of Sei Shonagon was written in this modern-day city, which was established as a capital by the Fujiwara Clan during the Heian Period. This city was spared from bombing during World War Two due to the efforts of Henry Stimson, and this city was replaced as capital of one city by Edo, later called Tokyo. For the points, name this former imperial seat in central Japan.

ANSWER: **Kyoto**

(3) Catalan's identity generalizes an identity discovered by this man, which relates elements of the Fibonacci sequence to a power of negative one. According to laws stated by this man, the rotational axis of the moon has a constant angle of inclination to the ecliptic plane. The discoverer of moons like Tethys, for ten points, identify this Italian scientist who names a space probe that was the first to orbit Saturn.

ANSWER: Giovanni Domenico **Cassini** (accept **Cassini** space probe; accept **Cassini-Huygens**; accept **Cassini**'s laws; accept **Cassini**'s identity; accept **Cassini** oval; accept **Cassinian** ovals; accept **Cassinian** curves; accept ovals of **Cassini**)

(4) One group of this type is given the Sudley Trophy. Upper body movement is minimized among these groups by use of the glide step. Auxiliaries that add a visual element to the performances of these groups are known as color guards. Leaders of sections of these groups are known as drum majors. For ten points, name these ensembles that often perform live music at college football games.

ANSWER: **marching bands** (prompt on "band")

(5) The downtown grid structure of this city is nicknamed "Light's Vision" after its designer, Colonel Light. Since 1871, this city has been home to a large sports arena known as its namesake Oval, and this city's Victoria Square is also known by the Kauran name Tarntanyangga. This city is separated from its suburbs by a namesake Park Lands along the River Torrens. For ten points, name this fifth largest city in Australia, the capital of South Australia.

ANSWER: **Adelaide**

(6) Jets of particles are released when hadrons are hit by particles as a result of this force's color confinement property. The carrier particle for this force at ranges of around three femtometers is the meson, while the carrier at short ranges is a massless gauge boson called the gluon, and this force is around ten to the 38 times more powerful than gravity. For ten points, name this force, which is responsible for constraining quarks to form hadrons like protons and neutrons.

ANSWER: **strong** force (or **strong** interaction; or **strong** nuclear force; accept **color** force)

(7) This author wrote a book about the Eloi, who are humans turned into livestock for the Morlocks, in *The Time Machine*. This author wrote a novel which follows Griffin, a scientist devoted to optics, who invents a way to change his body's refractive index, making him *The Invisible Man*. For the points, name this British science fiction author of *The War of the Worlds*.

ANSWER: H.G. **Wells**

(8) Playwright Václav Havel led this movement, which began after police brutally suppressed a student demonstration on International Students' Day. The Civic Forum and Public Against Violence emerged as key opposition groups during this event, and Alexander Dubček [[DOOB-chek]] returned to prominence during this movement, which ended Communist rule without bloodshed. For ten points, name this 1989 revolution that peacefully overthrew the Communist government of Czechoslovakia, named for its nonviolent nature.

ANSWER: **Velvet Revolution**

## Second Quarter

(1) In this novel, a woman named Justine Moritz is hanged for the murder of a boy in her care, a crime which she did not commit. This novel is framed as a series of letters from Robert Walton, a captain in the Arctic to whom the dying protagonist relates the plot. This novel explores the dangers of unchecked ambition, as the protagonist's relentless pursuit of scientific knowledge leads him to create a living being from dead tissue. For ten points, name this Gothic novel by Mary Shelley.

ANSWER: **Frankenstein**, or, *The Modern Prometheus*

BONUS: Mary Shelley, who wrote *Frankenstein*, was the daughter of this English writer who wrote *A Vindication of the Rights of Woman*.

ANSWER: Mary **Wollstonecraft**

(2) The beta form of this material is found only in the clade *Sauropsida*, and the alpha form of this material is a food source for organisms that cause *tinea pedis*, or athlete's foot. Classified as a scleroprotein, this material has a protective function and is known for its strength, which allows this material to function in spider silk and armadillo plates. For ten points, name this family of proteins important to the structure of rhinoceros horns, as well as human hair and nails.

ANSWER: **keratin** (accept beta-**keratin**; accept alpha-**keratin**)

BONUS: Along with the eponychium, this semi-circular layer of dead skin cells forms a protective seal at the base of the nail and is removed during a manicure.

ANSWER: **cuticle**

(3) The Truman Doctrine was formed based on disputes over a waterway this country controlled. This country was reformed under the ideology of Kemalism in the 1920s. As part of the resolution of the Cuban Missile Crisis, John F. Kennedy agreed to remove nuclear weapons from Italy and this country, which invaded Cyprus after a Greek-sponsored coup. For ten points, name this country which moved its capital to Ankara after the fall of the Ottoman Empire.

ANSWER: Republic of **Turkey** (or **Turkiye** Cumhuriyeti)

BONUS: The Cuban Missile Crisis weakened the political standing of this Soviet leader, known for his policy of de-Stalinization.

ANSWER: Nikita **Khrushchev** (or Nikita Sergeyevich **Khrushchev**)

(4) This artist is associated with an artistic style called *schacciato*, which involves very shallow reliefs. This artist created *Saint George Freeing the Princess*, which was once located on the edifice of the Orsanmichele [[OR-san-mih-KEH-lay]]. This artist depicted Erasmo of Narni in the statue *Gattamelata*, and he also made the first freestanding nude male sculpture since the fall of Rome. For ten points, name this Renaissance sculptor who created a bronze *David*.

ANSWER: **Donatello** (or Donato di Niccolò di Betto **Bardi**)

BONUS: The *Gattamelata* statue of Erasmo by Donatello portrays him taking part in this activity.

ANSWER: **riding a horse** (or **equestrian**ism; accept clear-knowledge equivalents)

(5) This mathematician invented a function to count the numbers relatively prime to a number  $n$ , called the totient function. This mathematician's studies of graph theory led to the solution of the Seven Bridges of Königsberg problem, and this mathematician's namesake identity states that "e to the i times pi plus one is equal to zero." For ten points, name this Swiss mathematician who gave the definition of the number "e."

ANSWER: Leonhard **Euler** ["OILER"] (accept **Euler**'s identity; accept **Euler**'s equation; accept **Euler**'s totient function; accept **Euler**'s phi function)

BONUS: Euler is credited with founding this branch of mathematics which studies networks of nodes and edges, inspired by the problem of the Seven Bridges of Königsberg.

ANSWER: **graph** theory

(6) A 1505 painting by Raphael is titled *Young Man with* one of these objects, while another Raphael work sees the Three Graces holding these objects. A poem by Robert Frost about these objects features the line "I feel the ladder sway as the boughs bend." A painting in the Art Institute of Chicago titled *A Basket Of* these objects is by Paul Cezanne. For ten points, name this fruit, a green example of which is placed in front of a man's face in René Magritte's *Son of Man*.

ANSWER: **apples**

BONUS: *Two-word answer required.* In many Renaissance paintings, an apple held by Eve symbolizes this biblical concept, which explains the origin of human evil.

ANSWER: **original sin**

(7) In the U.S., this agricultural practice is the final step in the wastewater treatment process, because it allows for the productive disposal of sewer water. The furrow system of this practice is used for row crops, including sugar beets, potatoes, and cottons, and a popular tool for this practice is the sprinkler. For ten points, identify this system of water movement for the cultivation of crops.

ANSWER: **irrigation**

BONUS: The ancient Sumerians developed one of the earliest large-scale irrigation systems in this region, named for its "crescent" shape, relying on the Tigris and Euphrates Rivers.

ANSWER: **Fertile** Crescent

(8) This man was named the first commandant of the combined NASA-Air Force training project, the Aerospace Research Pilot School in 1962. Earlier, while working for the National Advisory Committee for Aeronautics, this man piloted the Bell X-1 in an October 1947 experiment designed to exceed Mach 1. For ten points, name this pilot who became the first to fly an aircraft at supersonic speed.

ANSWER: Chuck **Yeager** (or Charles Elwood **Yeager**)

BONUS: Chuck Yeager's exploits as a test pilot are prominently featured in this 1979 book by Tom Wolfe, which was adapted into a 1983 film of the same name.

ANSWER: *The* **Right Stuff**

### Third Quarter

The categories are:

1. British Novelists
2. Mountains
3. Albert Einstein

**British Novelists**

Concerning British novelists, name the...

- (1) Constituent country of the UK that is home to many authors from London.

ANSWER: **England**

- (2) Charles Dickens novel in which Ebenezer Scrooge is visited by four ghosts during a certain holiday.

ANSWER: A ***Christmas Carol***. *In Prose. Being a Ghost Story of Christmas*

- (3) Cross-Europe luxury train in the title of an Agathie Christie novel.

ANSWER: ***Orient Express*** (accept *Murder on the ***Orient Express****)

- (4) Woman who wrote *Pride and Prejudice* and *Sense and Sensibility*.

ANSWER: Jane **Austen**

- (5) 1922 modernist novel by Irishman James Joyce, which finished number one on the Modern Library's "100 Best Novels" list.

ANSWER: ***Ulysses***

- (6) Male pen name of Mary Ann Evans, the author of *Silas Marner* and *Middlemarch*.

ANSWER: George **Eliot**

**Mountains**

Concerning the mountains of the world, name the...

(1) Molten rock, or magma, that spews from volcanic mountains, including Etna and Kilauea [[kih-lah-WEH-ah]].

ANSWER: **lava**

(2) Highest mountain in the world, located on the China-Nepal border.

ANSWER: Mount **Everest** (or **Qomolangma**)

(3) Asian range in which nine of the world's ten highest mountains are found.

ANSWER: **Himalayan** Mountains (or **Himalayas**)

(4) Highest mountain in Africa, located in Tanzania.

ANSWER: Mount **Kilimanjaro**

(5) National park on the Tennessee-North Carolina border, the most visited park in the U.S.

ANSWER: **Great Smoky Mountains** National Park (prompt on partial answers)

(6) Highest mountain in Ecuador, the peak of which is the furthest point on Earth's surface from its center.

ANSWER: **Chimborazo**

*Albert Einstein*

Concerning the theories and discoveries of Albert Einstein, name the...

(1) Electromagnetic radiation that he calculated was made of photons, which is perceivable with the human eye.

ANSWER: **light**

(2) Extremely dense "holes," about which he theorized, the gravity of which is too strong for anything to escape.

ANSWER: **black** hole

(3) Siblings from the same pregnancy in the title of a "paradox," which involves one sibling aging at a different rate in space.

ANSWER: **twin** (accept **twin** paradox)

(4) Word found in the names of his "general" and "special" theories, which refers to differences in reference points.

ANSWER: **relativity** (accept general **relativity**; accept special **relativity**)

(5) Device with an acronymic name, made possible after his introduction of stimulated emission of radiation.

ANSWER: **laser** (accept **maser**)

(6) Quantum phenomenon he called "spooky action at a distance," whereby particles are intrinsically related even when far apart.

ANSWER: quantum **entanglement**



#### Fourth Quarter

(1) **This rebellion was spurred by a volcanic eruption in Sicily that turned the sky greenish-blue and a solar eclipse, said by its instigator to be a black man's hand over the sun. (+)** This American rebellion's instigator was hung to death in a town called Jerusalem, where he asked, "Was Christ not crucified?" and the USS *Natchez* landed in Norfolk to help suppress this rebellion in (\*) Southampton, after which the literacy of slaves was made illegal. For ten points, name this 1831 slave rebellion in Virginia.

ANSWER: **Nat Turner**'s slave rebellion (accept **Southampton** Insurrection until read)

(2) **This response's effect on photosystem two can be measured by Fv/Fm tests in plants, and although polyphenols measure this response, the xenohormesis hypothesis claims animals benefit from eating polyphenols. (+)** Hans Selye attempted to explain these responses with a model featuring three stages: alarm, resistance, and exhaustion, which was a general adaption syndrome. Leading to the creation of (\*) adrenaline and activating fight-or-flight responses, for ten points, what are these biological responses to potentially threatening events?

ANSWER: **stress** (accept acute **stress** response; accept **stress** response; accept plant **stress**; accept **general adaptation syndrome** before "general adaptation syndrome" is read; accept **fight-or-flight** response or **fight-flight-freeze-or-fawn** response or **hyperarousal** before "fight-or-flight" is read; do NOT accept or prompt on "stressors")

(3) **The earliest eyewitness account of this event was thought to have been published by Clare Hollingworth. One attempt to justify this action was by citing a false flag operation on a radio station the night before it occurred. (+)** This event inspired a poem in which a man claimed that "clever hopes expire / Of a low dishonest decade." That poem was written by W.H. Auden and is titled for the day on which it occurred. (\*) For ten points, name this military action that occurred on September 1, 1939, starting World War Two in Europe.

ANSWER: Nazi **invasion of Poland** on September 1, 1939 (accept German **invasion of Poland** on September 1, 1939)

(4) **This man authored the work *Dialogus de oratoribus* on rhetoric and published a biographical account of his father-in-law, Gnaeus Julius Agricola. This man wrote the ethnographic work *Germania* and carried on correspondence with (+) Pliny the Younger. One of this man's works provides one of the first non-Christian accounts of the crucifixion of Jesus. The author of the (\*) *Histories* and the *Annals* is, for ten points, what Roman historian active during the first and second centuries?**

ANSWER: Publius Cornelius **Tacitus**

(5) **A large igneous province can be created by a "swarm" of these structures, which form within rift zones. Feeder examples of these structures allowed magma to travel from magma chambers to intrusions. Sheet intrusions are classified as (+) sills when they form between layers of layered rock, while if they form by cutting into unlayered rock, they are classified as these structures. (\*)** For ten points, name these rock structures which is formed in a fracture of an existing rock body.

ANSWER: **dikes** (or **dykes**; accept feeder **dike**; accept **dike** swarm; accept **dyke** swarm)

(6) **This man's namesake skyscraper at 8 Spruce Street was formerly the tallest residential building in the Americas. This man created the Dwight D. Eisenhower Memorial, incorporating a mesh tapestry to depict the Normandy Landings. This man was credited with helping revive downtown (+) Los Angeles with his design of a performing arts venue noted for its complex acoustic design. (\*)** For ten points, name this American architect known for designing the Walt Disney Concert Hall and the Guggenheim Museum in Bilbao.

ANSWER: Frank **Gehry** (or Frank Owen **Gehry**; accept Frank Owen **Goldberg**; accept New York by **Gehry**)

(7) **A conflict that occurred in this city arose after Monsieur Remontel reported a looting at his pastry shop. Tres Zapotes in this city was among the centers of the Olmec culture. In the aftermath of an incident in (+) Tampico involving the detention of American sailors, a seven-month occupation of this city was undertaken. In 1847, Winfield (\*) Scott oversaw a 20-day siege of this city. For ten points, name this major historical port of Mexico.**

ANSWER: **Veracruz**

(8) **Lesser-known varieties of this plant include the Blue Java. The “Taiyo no Tomago,” or “Egg of the Sun,” is the most (+) expensive variety of this plant and can cost up to five dollars per fruit in Japan. The Big Mike, or Gros Michel, variety of this plant was largely eradicated by Panama disease in the 1950s, forcing farmers of this crop to turn instead to the (\*) Cavendish variety. For ten points, name this potassium-rich fruit often used to ease muscle cramps.**

ANSWER: **bananas**

### Extra Questions

(1) **This country is known for its scenic Lake Bled, overlooked by the Julian Alps. Melania Trump was born in this country's city of (+) Novo Mesto, and this country has a small northeastern border with Hungary alongside narrow coastline on the Adriatic Sea. This country was the (\*) northernmost part of the former Yugoslavia. Situated between Croatia and Italy is, for ten points, what Balkan country governed from Ljubljana [[LYOOB-lyah-nah]]?**

ANSWER: Republic of **Slovenia** (or Republika **Slovenija**)

BONUS: This organelle is sometimes known as the "powerhouse of the cell," as it is the site where cellular respiration takes place.

ANSWER: **mitochondrion** (or **mitochondria**)

(2) **The third movement of this composer's second violin concerto is nicknamed "Rondo à la clochette" for its inclusion of bells, and this composer commissioned Berlioz's *Harold in Italy*. The theme (+) "A-A-A-B-C-A-E" opens two books of variations by Brahms based on an A-minor work by this composer of "The Hunt" and "The Devil's Laughter." This composer allegedly sold his soul to the devil (\*) in exchange for his virtuoso technique. For ten points, name this Italian composer who wrote the 24 Caprices for Solo Violin.**

ANSWER: Niccolò **Paganini**

BONUS: This term is used for all equilateral quadrilaterals, having sides of the same length regardless of the angles between them.

ANSWER: **rhombus** (accept **diamond**; do NOT accept or prompt on "square," "kite," or "parallelogram")