Illinois Masonic Academic Bowl
2022 State Tournament

Round 1
1st Section
Toss-up Questions

Question #1: Social Studies

10 points

This program was supported by the slogan "Going all out, aiming high and achieving greater, faster, better, and more economical results". Before it started, the person who oversaw this program said his country would overtake Britain in economic production in 15 years. This program started with a focus on conserving water before moving to a massive collectivization. Because of bad incentives, furnaces were used to melt farm equipment into steel. This program led to massive famines that killed millions of people during the early 1960s. Name this second Five-Year Plan that was overseen by Mao Zedong.	**Great Leap Forward** [or **Dayuejin**; prompt on second **Five-Year Plan** before "second"]

Question #2: Miscellaneous

10 points

During the season-4 finale of this television show, one of the characters finds out that her father—who was played by Beau Bridges—has died. As a result, Anna Deavere [duh-VEER] Smith's character Alicia Johnson is now a widow. The main characters on this show are a husband and wife who are an advertising executive and an anesthesiologist. Some recurring characters on this show are played by Raven-Symoné [sih-MOHN] and Daveed [dah-VEED] Diggs. The main characters, nicknamed "Dre" [dray] and "Bow" [boh], are played by Anthony Anderson and Tracee Ellis Ross. Name this ABC show that started in 2014 and is about a wealthy African-American family.	***Black-ish***

Question #3: Science

10 points

This phenomenon and the energy associated with it can be measured by a contact angle goniometer [goh-nee-AH-mih-tur]. A coefficient representing this phenomenon is in the numerator of Jurin's [JUR-in'z] law, which is used to analyze capillary action. This phenomenon can be measured using a vertical plate called a Wilhelmy plate or a slowly rising ring called a Du Noüy [nwee] ring. This phenomenon occurs when cohesion is stronger than adhesion because liquid molecules have a stronger attraction to each other than they do to nearby air molecules. Name this phenomenon that explains why some insects are able to walk on water.	**surface tension**

Question #4: Literature

10 points

In one novel by this author, the protagonist's wife Madeleine leaves him for a man with a wooden leg named Valentine Gersbach. In that novel, this author had the protagonist write, "History, memory—that is what makes us human" in a letter to President Eisenhower that, like many letters in that novel, was never sent. In another novel by this author, Thea Fenchel wants to go to Mexico to train an eagle to hunt lizards. This author ended that novel in France after the protagonist grows up in Chicago. Name this author of *Herzog* and *The Adventures of Augie March*.	Saul **Bellow** [or Solomon **Bellows**]

Question #5: Mathematics

10 points

This quantity is typically multiplied by a constant to get the length of the thin line in a violin plot. For a normal distribution, this quantity equals about 1.349 times the population standard deviation. This quantity and the median absolute deviation are extremely robust measures of dispersion. This quantity is multiplied by a constant when calculating Tukey's fences to classify outliers. This quantity equals the width of the box in a box-and-whiskers plot, and it also equals the 25% trimmed range. Name this measure of dispersion for a distribution, equal to the third quartile minus the first quartile.	**interquartile range** [accept **IQR** or **midspread** or **H-spread**; prompt on **middle 50%**]

Question #6: Social Studies

10 points

This economist was the subject of a 2016 book by Alison Bashford and Joyce Chaplin that explains how he moved towards an analysis of the impact of the New World and away from a critique of utopianism. This economist was critical of Say's Law and David Ricardo in his book *Principles of Political Economy*. This economist's 1798 work *An Essay on the Principle of Population* made pessimistic projections. Name this English economist whose so-called "trap" is based on the idea that standards of living cannot rise because increases in goods cause increases in population.	Thomas (Robert) **Malthus**

Question #7: Science

10 points per part

The simplest version of this system has a moment equal to charge times displacement.		
1	Name this type of system whose simplest version consists of two equal but opposite charges separated by a distance.	electric **dipole** [**"DIE-pole"**]
2	The torque on an electric dipole is the cross product of the electric dipole moment with this quantity.	electric **field** strength or E-**field** [prompt on **E**]
3	Dipoles are used to explain the workings of these insulators that are placed inside of capacitors.	**dielectric**s [**"die-electric**s"]

Question #8: Science

10 points per part

This type of oscillation can be approximately demonstrated by a weight hanging from a spring.		
1	Give this three-word term for motion caused by a restoring force that is proportional to displacement. Your answer should have three words.	**simple harmonic motion** or **simple harmonic oscillation** [accept **simple harmonic oscillator**; prompt on **SHM** or **SHO**]
2	A pendulum exhibits simple harmonic motion if you make the simplifying assumption that what function is always equal to the angle theta?	**sin**e theta or the **sin**e of the angle of displacement from equilibrium
3	For a pendulum, this quantity equals length times mass times little g times sine theta. Give a one-word answer.	**torque**

Question #9: Literature

10 points per part

One of the characters in this novel storms out of the room after saying "I shall be as dirty as I please: and I like to be dirty, and I will be dirty."		
1	Name this novel in which Heathcliff gets upset after being compared to the Linton children.	***Wuthering Heights***
2	Name the author of *Wuthering Heights*. Her sisters Charlotte and Anne also wrote.	**E**mily **Brontë** [accept **E**llis **Bell**; prompt on **Emily** or **Brontë** or **Ellis** or **Bell**]
3	In *Wuthering Heights*, Lockwood finds this first name scratched into paint, followed by three different last names.	**Catherine** [do not accept variants]

Question #10: Literature

10 points per part

This poem states "Now you will not swell the rout of lads that wore their honors out."		
1	Name this poem that begins "The time you won your town the race, we chaired you through the market-place."	**"To an Athlete Dying Young"**
2	"To an Athlete Dying Young" is in this English poet's collection *A Shropshire Lad*.	A(lfred) E(dward) **Housman**
3	A. E. Housman also wrote "When I Was One-and-Twenty", whose narrator claims to currently be this age.	**22** or **two-and-twenty**

Question #11: Fine Arts

10 points per part

Rembrandt said "A painting is complete when it has the shadows of a god."		
1	Name the short title often given to Rembrandt's *Militia Company of District II under the Command of Captain Frans Banninck Cocq.*	*The* ***Night Watch*** [or *De* ***Nachtwacht***]
2	In another painting, Rembrandt depicted this woman from Greek mythology naked in bed under an angel. It probably is set just before she was impregnated.	***Danaë*** [dan-AY-ee]
3	One painting showing Rembrandt and his wife is sometimes titled for this character being in a brothel. In another Rembrandt painting, this character kneels and is comforted by his father.	the **Prodigal Son**

Question #12: Fine Arts

10 points per part

Identify these abstract expressionist painters:		
1	This painter's technique was sometimes called "action painting" or "drip painting", so he was nicknamed "Jack the Dripper".	(Paul) Jackson **Pollock**
2	This painter, who moved from the Netherlands to the United States, made a series of paintings titled *Woman*.	Willem de **Kooning**
3	This painter stated "There are no rules." She developed the soak stain technique, which can be seen in her painting *Mountains and Sea*.	Helen **Frankenthaler**

Question #13: Social Studies

10 points per part

In this country's September 2021 elections, the Social Democratic Party had its best showing in a long time, which is why this country is now headed by Olaf Scholz.		
1	Name this country that held elections to determine a successor for Angela [AHNG-eh-luh] Merkel.	(Federal Republic of) **Germany** [or Bundesrepublik **Deutschland**]
2	Voters in the election chose members of this German parliament. It meets in the Reichstag [RYK-shtahg] building.	**Bundestag** [**BOON-duh-shtahg**]
3	Many of the flights carrying people out of Afghanistan at the end of the war in August 2021 went to this German air base.	**Ramstein** [**RAHM-shtyn**]

Question #14: Social Studies

10 points per part

Name these places in the Caribbean Sea.		
1	In 2021, this French-speaking country experienced the murder of President Jovenel Moise and an earthquake that killed thousands of people.	(Republic of) **Haiti** [or Republique d'**Haïti** or Repiblik d' **Ayiti**]
2	These islands make up the most populous British Overseas Territory in the Caribbean. This location is a financial haven because it has no income, capital gains, or wealth tax.	**Cayman** Islands [accept **Caymans**]
3	This country stopped recognizing the British monarch as its head of state in 2021. Its leaders are President Sandra Mason and Prime Minister Mia Mottley.	**Barbados**

Question #15: Science

10 points

Proteins whose names indicate that they are similar to this one have a repeating amino acid pattern of glycine [GLIE-seen] followed by two different amino acids. To be stable, this protein requires hydroxy·proline ["hide-ROCKS"-ee-PROH-leen] and proline [PROH-leen], which are added to this protein in the presence of vitamin C. Defects in this protein cause Alport syndrome and Ehlers-Danlos syndrome. This protein is the most abundant protein in humans. Combining this sclero·protein [SKLAIR-oh-"protein"] with boiling water creates gelatin. This protein has a triple-helix structure. Name this protein that is a central component of ligaments and cartilage.	**collagen**

Question #16: Literature

10 points

In one novel by this author, a fictional character has an imaginary son who is in black-and-white and talks to spirits. This author made that fictional character in the mind of spy-novel writer Sam DuChamp, and the character is a modern American version of Don Quixote. In another novel by this writer, the narrator's sister is a famous singer who is known as the Brass Monkey. This author's narrator has supernatural powers, and after being switched at birth is raised by a wealthy family in Bombay. Name this author of *Quichotte* [kee-shawt] who wrote about Saleem Sinai [si-NIE] in *Midnight's Children*.	(Ahmed) Salman **Rushdie**

Question #17: Fine Arts

10 points

Late in his career, this musician recorded an album that had Joe Zawinul [ZAW-wi-nul], Herbie Hancock, and Chick Corea [kor-EE-uh] all play electric piano. That album by this musician features the songs "Shhh" and "Peaceful". Much of this performer's music was arranged by Gil Evans, including his performance of "Concierto de Aranjuez" [kohn-see-AIR-toh day ar-ahn-WEZ] on *Sketches of Spain*. The song "Flamenco Sketches" appears on an album by this musician that features the saxophonists "Cannonball" Adderley and John Coltrane. Name this jazz trumpeter who recorded the albums *In a Silent Way* and *Kind of Blue*.	Miles (Dewey) **Davis** (III)

Question #18: Social Studies

10 points

This general was put in charge of the troops who had lost at the Battle of Kasserine [KASS-uh-reen] Pass, and he led them to win the Battle of El Guettar [guh-TAR]. This general then pushed his troops to get to Messina [meh-SEE-nuh] as fast as possible because he wanted to get there before the British troops under his ally Bernard Montgomery. During that fighting on Sicily, this general thought some troops in a hospital were cowardly, so he slapped them, which Dwight Eisenhower made him apologize for. This general then led troops into Germany after the Battle of the Bulge. Name this subject of a George C. Scott movie who was nicknamed "Old Blood and Guts".	George S(mith) **Patton** (Jr.)

Question #19: Science

10 points

The bacteria that causes this disease is in the same genus [JEE-nus] as botulism bacteria and blocks the brain from releasing acetyl·choline [uh-SEE-tull-KOH-leen]. Chemicals that are used for arrow poisons are sometimes used to treat the muscle spasms caused by this disease. This disease is characterized by both spasms and rigidity, sometimes to the point that breathing or swallowing is impossible. Humans often get this disease from a puncture wound that causes dirt to get into the body. Despite a common misconception, rust does not cause this disease. Name this disease that used to be called "lockjaw".	**tetanus** [prompt on **lockjaw** before the end]

Question #20: Literature

10 points

One poem by this writer contains the stanza "True, a new mistress now I chase, the first foe in the field; and with a stronger faith embrace a sword, a horse, a shield." That poem is paired with another poem by this writer whose title contains the phrase "Going beyond the Seas". Another poem by this writer begins "When love with unconfined wings hovers within my gates". This writer began the last stanza of that poem with the lines "Stone walls do not a prison make, nor iron bars a cage." Name this English poet who wrote "To Lucasta, Going to the Wars" and "To Althea, from Prison".	Richard **Lovelace**

Question #21: Mathematics

10 points per part

This concept is very similar to that of residual and error.		
1	Name this quantity found by subtracting an observed value minus the expected value, where the expected value is often the mean. Give a one-word answer.	**deviation**
2	This quantity equals the average value of the squares of the deviations. This quantity is the square of the standard deviation.	**variance**
3	What is the variance of the standard normal distribution? Your answer should be a number.	**1**

Question #22: Mathematics

10 points per part

The number of vertices of these shapes equals the dimension plus 1.		
1	Name this class of shapes that includes triangles and their higher-dimensional analogues.	**simplex**es or **simplices**
2	This Platonic solid is the three-dimensional simplex. It therefore has four vertices.	**tetrahedron** [prompt on triangular **pyramid** or triangle-based **pyramid**]
3	How many edges does a tetrahedron have?	**six** edges

Question #23: Social Studies

10 points per part

This person left a letter in 1853 and then signed a treaty in 1854.		
1	Name this U.S. Commodore who opened up Japan.	Matthew C(albraith) **Perry**
2	Matthew Perry's brother Oliver Hazard Perry sent the message "We have met the enemy and they are ours" after this battle in the War of 1812.	Battle of **Lake Erie** or Battle of **Put-in-Bay**
3	Based on a quote from James Lawrence, Oliver Hazard Perry put these words on his battle flag.	**"Don't Give Up the Ship"**

Question #24: Social Studies

10 points per part

The United States fought three wars against these people between 1816 and 1858.		
1	Name these Native Americans, many of whom live in Florida.	**Seminole** people or **Seminole**s
2	This person led several Seminole fighters during the Second Seminole War, but he was captured under a false flag of truce. This person died while still in captivity.	**Osceola** [**ah-see-OH-luh**] [or Billy **Powell** or **Asi-yahola**]
3	While Osceola was busy killing Wiley Thompson, several Seminoles took part in this event that killed 107 members of the U.S. Army going from Fort Brooke to Fort King.	**Dade**'s massacre

Question #25: Science

10 points per part

These storms are the same type of storm as cyclones or typhoons, but they take place in the Atlantic Ocean or northeastern Pacific Ocean.		
1	Name these massive storms that often strike the southeastern United States.	**hurricane**s
2	The strongest Atlantic hurricanes usually start near these islands west of Senegal.	**Cape Verde** [or **Cabo Verde**]
3	This effect occurs in storms where the clouds surrounding the eyewall bend outwards. This effect is named for what the clouds look like.	**stadium** effect

Question #26: Science

10 points per part

This scientist spent part of her career as an actuarial assistant.		
1	Identify this namesake of two discontinuities in the structure of the Earth, one just below the continents and another between the Earth's inner and outer core.	Inge **Lehmann**
2	Lehmann deduced properties of the Earth by studying readings of these instruments that measure earthquakes.	**seismograph**s [**"SIZE"-moh-graph**s] or **seismometer**s
3	Lehmann studied seismic ["SIZE"-mik] waves that started traveling from the epi·center towards this point on the opposite side of the Earth.	**antipode** [or **antipodal** point]

Question #27: Literature

10 points per part

This god used the hammer Mjölnir [mee-YOHL-neer].		
1	Name this god of thunder in Norse mythology.	**Thor**
2	Thor was the enemy of this creature also known as the Midgard Serpent.	**Jörmungand**r [**YOR-mun-gahnd**-ur] [prompt on **World Serpent**]
3	Thor caught Jörmungandr while fishing with this giant and using this giant's ox as bait. This giant cut the line, so they will fight again at Ragnarök.	**Hymir**

Question #28: Literature

10 points per part

This goddess was the first child of Kronos [KROH-nohss] to be swallowed.		
1	Name this goddess of the hearth, the Greek equivalent of the Roman goddess Vesta.	**Hestia**
2	Though Hestia was not written about often, she was invoked by this writer in one of his *Nemean Odes*.	**Pindar** [or **Pindaros** or **Pindarus**]
3	Celebrations of Hestia often praised this type of animal, which woke her up one time before she was attacked by Priapus ["pry"-AY-puss].	**donkey**(s) or **ass**(es)

Question #29: Mathematics

10 points

A point named for this concept can also be called a cluster point or accumulation point and is used in one topological definition of closedness. A metric space is called complete if, for every Cauchy [koh-shee] sequence in the space, this concept exists and is in the space. The squeeze theorem helps prove this concept by comparing one function to two other functions. A function is continuous where this concept exists and equals the function's output, and like continuity, this concept is commonly defined using the symbols "delta" and "epsilon". Name this concept in which a function approaches—but might not reach—a value.	**limit**(s) [accept **limit** points]

Question #30: Social Studies

10 points

Despite being outnumbered, this person was able to win a battle against John de Warenne, Earl of Surrey by trapping enemy troops on and near a narrow bridge, though this person's ally Andrew Moray was fatally wounded. This person lost the Battle of Happrew, but he was able to escape with his ally Simon Fraser. Much earlier, this person lost the Battle of Falkirk. This hero of the Battle of Stirling Bridge was eventually executed on the orders of Edward I. Name this 13th- and 14th-century fighter who was replaced by Robert the Bruce as a leader in the First War of Scottish Independence.	William **Wallace**

Question #31: Science

10 points

This process can be done with silver perchlorate [pur-KLOR-"ate"] to poly·acetylene [PAH-lee-uh-SEE-tuh-leen] to get that material to behave like a metal. This process is often done with boron or phosphorus, because elements with three or five valence electrons improve the efficiency of elements with four valence electrons. The material that this process is done to becomes either an *n*-type or a *p*-type, depending on whether it becomes more efficient at conducting electrons or holes. This process can increase conductivity by a factor of 1 million. Name this purposeful introduction of impurities into a semiconductor crystal.	semiconductor **doping** [accept **dope**d or **dopant**]

Question #32: Literature

10 points

At the beginning of a novel by this author, the narrator is given a mop and then hears somebody describe him as "big enough to eat apples off my head". This author's narrator thinks that he is cagey because he is half-Indian, though some characters think that the narrator is deaf. This author had that narrator, Chief Bromden, perform a mercy killing on Randle McMurphy after McMurphy's lobotomy. This author used the money he made from that book to buy a bus called *Furthur* for the Merry Pranksters, which was described in Tom Wolfe's book *The Electric Kool-Aid Acid Test*. Name this author of *One Flew Over the Cuckoo's Nest*.	Ken(neth Elton) **Kesey**

Extra Question #1: Science

10 points

This person often worked closely with Justus Liebig [YOOSS-tooss LEE-bik], and together they are credited with making lab-work part of science classes. Before aluminum was produced by the Hall-Héroult [air-ohl] process, this person refined a process by Hans Christian Ørsted that used potassium to get aluminum metal. Another production process discovered by this scientist created a substance made of the same elements in the same proportion as ammonium cyanate ["SIGH"-uhn-"ate"]. That discovery is given much credit, though probably too much credit, for ending the belief in vitalism. Name this German scientist who in 1828 synthesized urea [yur-EE-uh].	Friedrich **Wöhler** [FREE-drik **VUH-lur**]

Extra Question #2: Social Studies

10 points

The capital of this country contains a statue to the scholar Ibn Khaldoun [kahl-DOON] in addition to the Cathedral of St. Vincent de Paul. This country contains a salty lake that is sometimes large called "Chott el Djerid [jeh-REED]", which is near its towns of Kebili [keh-BEE-lee] and Douz [dooz]. This country contains an ancient amphitheatre in the town of El Djem [jam]. The island of Djerba [JER-buh] is off the east coast of this country, in the Gulf of Gabès [GAH-bess]. This country is the closest African country to Italy. Name this country at the north end of the border between Algeria and Libya, the former site of Carthage.	(Republic of) **Tunisia** [or (al-Jumhuriyah at-)**Tunisiyah**]

Extra Question #3: Fine Arts

10 points

One painting by this artist shows a huge army of skeletons partly blocked by wooden slabs with crosses, but in the center of the painting the skeletons are knocking over the slabs and attacking people. This painter of *The Triumph of Death* made another work that depicts three people trudging downward towards some skating rinks. This painter depicted one of those people carrying a fox carcass, and the three people are followed by several dogs. Name this Dutch Renaissance painter of *The Hunters in the Snow* whose son was also a prominent painter.	Pieter **Bruegel** [**BROH-gull**] the Elder [accept Peasant **Bruegel**]

Extra Question #4: Mathematics

10 points

A formula named for this person finds the distance between the circumcenter and incenter of a triangle. This person is also the namesake of the simplest Runge–Kutta [ROON-guh KOO-tuh] method, which is used to approximate solutions to differential equations. The quantity "vertices plus faces minus edges" for a polyhedron is known as this person's "characteristic". The number of positive integers relatively prime to the input is called this person's totient [TOH-shent] function. Identify this mathematician who is the namesake of the irrational number equal to about 2.718, which is often written as e.	Leonhard **Euler** [**OY-lur**]

Extra Question #5: Literature

10 points

In this play, the line "No legacy is so rich as honesty" is spoken by Mariana. After that line, Mariana tells the old widow of Florence not to trust Parolles [puh-"ROLL"-ess]. At the beginning of this play, the Countess is upset because her second husband recently died and her son is going to serve the King of France. In this play, Helena is a ward of the Countess and is in love with the Countess's son Bertram. Helena speaks this play's title before saying "still the fine's the crown". Name this play by William Shakespeare whose title refers to the idea that it was acceptable for Helena to impersonate Diana and trade rings so that she could marry the man she loves.	***All's Well That Ends Well***

Extra Question #6: Social Studies

10 points per part

This empire ended when Brihadratha [brih-hah-DRAH-tuh] was assassinated in 185 BCE.		
1	Name this empire started by Chandragupta [CHAHN-druh-GOOP-tah].	**Maurya**n Empire
2	Chandragupta and Bindusara [bin-doo-SAH-rah] Maurya were advised by this person, who might be identical to the person named Kautilya [kau-TEEL-yuh] or Vishnu·gupta who wrote the *Artha-shastra*.	**Chanakya**
3	Following Chandragupta and Bindusara, this person ruled for 36 years. Early in his reign, he won the bloody Kalinga [kuh-LEEN-guh] War.	**Ashoka** the Great

Extra Question #7: Social Studies

10 points per part

This site is currently in Israel just north of the West Bank.		
1	Name this site of a 15th century BCE battle where Egypt defeated Kadesh [kuh-DESH].	**Megiddo** [**meg-EE-doh**]
2	Megiddo was a victory for this pharaoh. It happened at about the same time as the death of his co-regent, stepmother, and aunt Hatshepsut.	**Thutmose** [**thoot-MOH-suh**] **III** [prompt on **Thutmose**]
3	During World War I, Megiddo was the site of a British victory over the Germans and this large empire that was broken up a few years later.	**Ottoman** Empire

Extra Question #8: Science

10 points per part

The elevation of boiling point and the depression of freezing point caused by adding solutes are both these types of properties.		
1	Give this term for properties that depend on the amount of solute rather than properties of the solute.	**colligative** [**kuh-LIG-uh-tiv**] properties
2	This colligative property is defined as the pressure that must be applied to a solution to stop fluid movement across a semi·permeable membrane.	**osmotic** [**ahz-MAH-tik**] pressure
3	In Raoult's law, this quantity is multiplied by the equilibrium vapor pressure of the component to calculate total vapor pressure, which is another colligative property.	**mole fraction** [do not prompt on partial answers]

Extra Question #9: Science

10 points per part

The atomic bomb dropped on Hiroshima used uranium, but the bomb dropped on Nagasaki used this element.		
1	Identify this element named after an object that was considered to be a planet at the time.	**plutonium** [accept **Pu**]
2	This person and Edwin McMillan shared a Nobel Prize for discovering plutonium and other transuranic ["trans"-yur-AN-ik] elements.	Glenn T(heodore) **Seaborg**
3	Plutonium is often used in these reactors that create fissile [FISS-"isle"] material faster than they use it.	**breeder** reactors