Illinois Masonic Academic Bowl
2020 State Tournament

Round 1
1st Section
Toss-up Questions

Question #1: Social Studies

10 points

Under this monarch, a policy was enacted by which federal officeholders paid one-sixtieth of their salary to the crown in return for being able to name their successors. Shortly before this king was murdered, he sponsored expeditions by Samuel de Champlain that led to the creation of Quebec City. This person was the first Bourbon king of France. Just after this person married Margaret of Valois [val-wah], the St. Bartholomew's Day Massacre occurred. This king gave substantial rights to Huguenots [HYOO-guh-nahts] by issuing the Edict of Nantes [nahnt]. Name this king who might have said "Paris is well worth a mass" when he converted to Catholicism.	**Henry IV** (Bourbon of France) [or **Henry of Navarre** or **Henry III of Navarre** or **Henry of Bourbon** or **Henri de Navarre** or **Henry de Bourbon**; prompt on **Henry**]

Question #2: Science

10 points

In a famous incident, this person saw a woman and girl and told them "Don't be afraid, come here," and asked them where the nearest phone was before a truck came by to pick him up. Earlier that day, this person said "Let's go! Goodbye, until soon, dear friends." This person was eventually banned from further spaceflights in order to keep him safe, but he died in a plane crash a few weeks later. This person's only spaceflight lasted 108 minutes and made a single orbit around Earth, and it was on April 12, 1961 on Vostok I. Name this cosmonaut who was the first person ever to enter space.	Yuri (Alekseyevich) **Gagarin** [gah-GAR-in]

Question #3: Miscellaneous

10 points

One of the leagues in this sport faced a recent boycott led by Nicky Spiva ["SPY"-vuh] and Hannah Leathers over unequal gender representation. Henry Callahan, who was killed in 1982, is the namesake of both an award given to college players in this sport and a move in which a defender scores a point. The two main positions in this sport are handler and cutter; handlers make the important throws. Types of throws in this sport are called the "scoober" and the "high release flick". Like football, the goal of this sport is to advance over the goal line into the end zone. Name this sport overseen by the World Flying Disc Federation that is played with a frisbee.	**ultimate** frisbee [prompt on **frisbee**]

Question #4: Literature

10 points

In a backstory in this novel, Richard is beaten by police and put on trial, leading to his suicide. Elizabeth never told Richard that she was pregnant. In this novel, Brother Elisha [eh-"LIE"-shuh] teaches the Intermediate classes at the Temple of the Fire Baptized. One of his students, who turns 14 when this novel begins, is the protagonist. That character is the son of Richard and Elizabeth and the stepson of a preacher named Gabriel. Name this semi-autobiographical novel about John Grimes, set in Harlem by James Baldwin.	***Go Tell It on the Mountain***

Question #5: Social Studies

10 points

The worship of this god mentions his six divine sparks, which are his first six emanations. While this god was usually worshiped as a chief god, he was for a time considered one of the twin sons of Zurvan. The worship of this god includes the liquid hom being poured into a well or stream. Prayers to this god are said facing fires or the Sun, which signify this god's light and energy. The *yasna* ceremony is intended to strengthen this god and weaken his rival Angra Mainyu [AYN-gruh "MINE"-yoo]. This god is addressed by some Gathas in the *Avesta*. Name this chief god of Zoroastrianism [zo-roe-AS-tree-uhn-ism].	**Ahura Mazda** [or **Hurmuz**]

Question #6: Science

10 points

This compound is combined with formaldehyde to make the most common thermo·setting resin [REZ-in]. A breath test performed after swallowing this compound tests for *Helicobacter pylori* [HEL-ih-koh-BAK-tur "pie"-LOR-"eye"] infections. The cycle that produces this substance uses aspartate [uh-SPART-"ate"], and that cycle both uses and produces arginine [AR-juh-neen] and ornithine [OR-nuh-theen]. The conversion of ammonium cyanate ["SIGH"-un-"ate"] into this substance was first done by Friedrich Wöhler and was the first time an organic compound was made from inorganic reactants. Name this material that is excreted in urine.	**urea** [or **carbamide**]

Question #7: Literature

10 points per part

This character tells Elmire [el-meer] "You are my peace, my solace, my salvation; on you depends my bliss or desolation."		
1	Name this title character of a French play who is the houseguest of Orgon.	**Tartuffe** [tar-toof]
2	This bailiff serves eviction papers to Orgon. Dorine states that this person's name and his actions are opposites.	Monsieur **Loyal**
3	This playwright wrote *Tartuffe* as well as *The Misanthrope* and *The School for Wives*.	**Molière** [moh-lee-air] [or Jean-Baptiste **Poquelin**]

Question #8: Literature

10 points per part

The protagonist of this novel tells Adolphe [ay-dolf] to read the first word of any verse of a Bible, demonstrating that he can recite the rest of the verse.		
1	Name this novel in which Julien Sorel decides to become a soldier who seduces women, such as Madame de Renal, instead of becoming a priest.	*The **Red and** the **Black*** [or *Le **Rouge et le Noir***]
2	This author wrote *The Red and the Black*.	**Stendhal** [or Marie-Henri **Beyle**]
3	In Stendahl's novel *The Charterhouse of Parma*, Fabrizio del Dongo grows up in the castle of Grianta, which is next to what body of water?	Lake of **Como** [or Lago di **Como**]

Question #9: Mathematics

10 points per part

Decimal representations of these numbers terminate or repeat.		
1	Name these numbers that can all be expressed as an integer divided by an integer.	**rational** numbers or **rational**s [prompt on **Q**]
2	All rational numbers as well as some irrational numbers, are this type of number because they are solutions to a non-zero polynomial with integer coefficients.	**algebraic** numbers [accept **algebraic**s]
3	Find the only value of x such that both x and e to the x are both algebraic.	$x = \underline{\mathbf{0}}$

Question #10: Mathematics

10 points per part

The absolute value function is often defined this way.		
1	Name this way of defining a function differently for different parts of the domain.	**piecewise** definition or **piecewise**-defined function [prompt on **hybrid** function]
2	This rule is used to approximate an integral by treating a function as a piecewise function, each piece of which is a quadratic.	**Simpson**'s rule
3	Find the value of k if a *continuous* function is defined as kx plus 4 when x is less than 3, and $7x$ minus 2 when x is greater than or equal to 3.	$k = \underline{\mathbf{5}}$

Question #11: Social Studies

10 points per part

The 13th, 14th, and 15th amendments to the Constitution are collectively named for this period of time.		
1	Name this era in which the United States debated how to re-unite with the Confederacy and adjust to the end of slavery.	**Reconstruction** Era
2	This 1864 bill required that 50% of a state's white males take a loyalty oath for the state to be re-admitted to the Union. It passed Congress but was pocket-vetoed by President Lincoln.	**Wade-Davis** Bill
3	The Wade-Davis Bill was a reaction to this more lenient plan by President Lincoln. This plan became official when Lincoln signed the Proclamation of Amnesty and Reconstruction in 1863.	**Ten Percent** Plan

Question #12: Social Studies

10 points per part

This U.S. president had spent several years as the Collector of the Port of New York.		
1	Name this person who became president when James Garfield was assassinated.	Chester **Arthur**
2	Though Arthur was known for supporting the spoils system, he also supported the 1883 Civil Service Reform Act named for this Senator.	George **Pendleton** [accept the **Pendleton** Act]
3	President Arthur signed a bill prohibiting the use of this technology on public lands. This technology, which was fairly new at the time, was invented by Lucien Smith and Joseph Glidden.	**barb**ed **wire** [prompt on **fence**s or **fencing**]

Question #13: Science

10 points per part

This disease often causes acid to erode teeth.		
1	Name this eating disorder characterized by binging and purging.	**bulimia** [“bull”-EE-mee-uh] nervosa
2	Bulimia can lead to an overactivation of the body system that controls the balance between renin [REE-nin] and this hormone.	**angiotensin** [AN-jee-oh-TEN-sin]
3	This drug, commonly sold under the trade name “Prozac”, was the first SSRI antidepressant approved for treatment of bulimia.	**fluoxetine** [“flu-OX-uh-teen”] (hydrochloride)

Question #14: Science

10 points per part

This quantity is commonly measured to check whether patients are at risk of heart disease and kidney failure.		
1	Name this quantity that has systolic [siss-TAH-lik] and diastolic [“die”-uh-STAH-lik] components.	**blood pressure** [prompt on **BP**]
2	This is the medical term for low blood pressure. It can be caused by pain or dehydration.	**hypotension** [do not accept or prompt on “hypertension”; ask for a clear pronunciation or spelling if necessary]
3	In this type of hypotension, sometimes called “postural hypotension”, a person’s blood pressure drops when they stand up.	**orthostatic** hypotension [prompt on **vasovagal** hypotension]

Question #15: Literature

10 points

In this novel, one of the characters discusses listening to the song "'Twas rank and fame" with Richie Goulding while eating at the Ormond hotel. At the same time in this novel, Blazes Boylan is about to have an affair with that man's wife. The end of this novel is told from the point of view of the wife remembering their engagement; it says "His heart was going like mad and yes I said yes I will Yes." That wife, Molly, has many parallels with Penelope from *The Odyssey*. Name this stream-of-consciousness novel about Leopold Bloom that takes place in a single day and was written by James Joyce.	***Ulysses***

Question #16: Fine Arts

10 points

The second movement of this composer's *Piano Quintet in E-flat Major* is labeled "In modo d'una marcia, Un poco largamente" and is a funeral march. That piece influenced Romantic composers to combine a piano with a standard string quartet. This composer's first symphony has movements that were originally titled "Evening" and "Merry Playmates". That first symphony, which—like this composer's fourth symphony—was written in 1841, is nicknamed "Spring". This composer's work containing 20 short pieces set just before Lent is titled *Carnaval*. Name this German composer whose works were often performed by his wife Clara.	Robert **Schumann**

Question #17: Mathematics

10 points

This word can describe a polynomial whose values don't change if the variables are swapped. This word can also mean a type of group whose elements represent permutations. This word describes a matrix that is equal to its transpose. The relation "less than or equal to" is not an equivalence relation because, although it is reflexive and transitive, it does not have the property that this word means. Give this word for the property if x equals y, then y equals x.	**symmetric** or **symmetry**

Question #18: Social Studies

10 points

A woman born into this wealthy family started the Whitney Museum of American Art in New York. The family member most responsible for this family's wealth worked for Thomas Gibbons and convinced Gibbons to sue Aaron Ogden. That person built this family's fortune through shipping and by owning the New York Central Railroad. This family owned The Breakers in Rhode Island and Biltmore House in North Carolina. One member of this family made designer blue jeans and was Anderson Cooper's mother. Name this family whose patriarch was nicknamed "The Commodore", which explains the team name of the university named after him in Tennessee.	**Vanderbilt** family or the **Vanderbilt**s

Question #19: Science

10 points

This number is the principal quantum number of barium, cesium, and radon. When a central atom has this number of ligands [LIG-undz], a molecule can have either pentagonal pyramidal or octahedral molecular geometry. When one molecule of glucose is created in photosynthesis, this many oxygen molecules are also created. This is the oxidation number of the sulfur atom in a sulfate ion. This is the number of hydrogen atoms in an ethane [ETH-ayn] molecule, and it is the number of carbon atoms in a benzene molecule. Give this atomic number of carbon.	(positive) **6**

Question #20: Literature

10 points

This god was worshiped in the songs and stories of Narada [NAH-rah-dah]. The joys of worshiping this god are described by Prahlada [PRAH-lah-dah] in the Bhagavata Purana [bah-gah-VAH-tah pur-AH-nah]. This god decapitated Makara the Crocodile when it was attacking Gajendra [guh-JEN-druh] the elephant, who lifted a lotus to get this god's attention. In Hindu mythology, this god rides the eagle Garuda [gah-ROO-dah]. When Hindu grooms walk around their brides, they invoke the name of this god because of his exemplary marriage to Lakshmi. Rama and Krishna were avatars of this god. Name this "preserver" god who is in the Trimurti with Brahma and Shiva.	**Vishnu**

Question #21: Social Studies

10 points per part

This protection is given to people who would be prosecuted for their race, religion, nationality, political opinion, or social group.		
1	Name this protection given to a political refugee from another country.	**asylum**
2	In the U.S., most asylum cases are heard by Citizenship and Immigration Services, which is overseen by this Cabinet-level department.	Department of **Homeland Security** or **Homeland Security** Department or **DHS**
3	This other Homeland Security agency, which often works with USCIS and ICE, oversees the Immigration Inspection Program at ports of entry.	(US)**CBP** or US **Customs and Border Protection**

Question #22: Social Studies

10 points per part

This U.S. cabinet-level department has its headquarters in the D.C. neighborhood of Foggy Bottom.		
1	Name this department that oversees foreign policy, including embassies and ambassadors.	**State** Department [or Department of **State**]
2	The State Department oversees this exchange program for students, teachers, and other people to go to other countries.	**Fulbright**-Hays Program
3	Embassies are typically headed by ambassadors. This French title is given to a person who leads an embassy when there is no ambassador.	**chargé** d'affaires [**shar-zheh** dah-fair] [or **chargée** d'affaires [**shar-zhay** dah-fair]]

Question #23: Science

10 points per part

The composition of this material varies, but much of it is naphthenes [NAF-theens].		
1	Name this mixture, found in the Earth, that is mostly crude oil.	**petroleum** oil
2	Another major component of petroleum is this type of hydrocarbon, in which the number of hydrogen atoms in each molecule is two more than twice the number of carbon atoms.	**alkane**(s) [accept **paraffin**(s)]
3	This process creates alkanes and water from hydrogen and carbon monoxide.	**Fischer-Tropsch** process

Question #24: Science

10 points per part

The Le Bel–van 't Hoff rule determines how many of these isomers can exist.		
1	Give the term for any isomers that have the same molecular formula and sequence of bonded atoms, but different spatial arrangements.	**stereo·isomer**s or **stereo·isomer**ism [prompt on **spatial isomer**s or **spatial isomer**ism]
2	Give the two Latin prefixes for stereoisomers used to specify whether functional groups are on the same side of a molecule or opposite sides.	**cis** and **trans** [either order]
3	When there are more functional groups, a notation with these two letters is used to represent the way the groups are oriented.	**E**-**Z** notation [either order]

Question #25: Fine Arts

10 points per part

This term is often applied to ornate European art and architecture from the 17th century.		
1	Name this period of art. What used to be called the "late" part of this period is now called Rococo [ruh-KOH-koh].	**Baroque** period
2	This early Baroque artist painted the *Martyrdom of St. Matthew* and the *Calling of St. Matthew*.	(Michelangelo **Merisi** da) **Caravaggio** [accept either underlined name; do not accept or prompt on "Michelangelo"]
3	This Baroque architect who supported Louis XIV [14] designed the chapel of Les Invalides [lez awn-vah-leed] and played a major role in enlarging the Palace of Versailles [vair-"sigh"].	Jules Hardouin-**Mansart** [zhool ard-wan **mahn-sar**]

Question #26: Fine Arts

10 points per part

Identify these artists who made famous self-portraits:		
1	This Impressionist made *Self-Portrait with a Beret* in 1886 while living in Giverny [zhiv-air-nee].	(Oscar) Claude **Monet**
2	This American-born Impressionist painted women in many roles, including herself in *Portrait of the Artist*.	Mary **Cassatt**
3	This artist looks relaxed in *Self-Portrait with a Black Dog* but has his hands in his hair and his eyes opened wide in *The Desperate Man*, which he made in the 1840s.	Gustave **Courbet** [goo-stahv **koor-bay**]

Question #27: Literature

10 points per part

The protagonist of this novel states "You might as well advise me to give up my fortune as my argument." His friend then says "Your fortune, I am now sorry to inform you, is almost nothing."		
1	Name this novel about a family that is almost destroyed by Squire Thornhill, but saved by Mr. Burchell.	*The* ***Vicar of Wakefield***
2	This author wrote *The Vicar of Wakefield* and the play *She Stoops to Conquer*.	Oliver **Goldsmith**
3	In Jane Austen's *Emma*, the title character says of this man, "I know he has read *The Vicar of Wakefield*." This character eventually marries Harriet Smith.	**Robert Martin** [accept either]

Question #28: Literature

10 points per part

The protagonist of this novel lives at Tipton Grange with her sister Celia.		
1	Name this novel named for the fictional town where it is set. The protagonist of this novel marries Reverend Edward Casaubon [kuh-SAW-bun] and Will Ladislaw.	***Middlemarch***
2	This author wrote *Middlemarch* about Dorothea Brooke [pause] roughly a decade after writing *The Mill on the Floss* and *Silas Marner*.	George **Eliot** [or Mary Ann **Evans**]
3	In *Middlemarch*, Nicholas Bulstrode has this job. He spends much of the novel trying to suppress information about his past.	**banker**

Question #29: Mathematics

10 points

When this operation is applied to different elements of an orthonormal basis, the result is 0, but when it's applied to identical elements of an orthonormal basis, the result is 1. Performing this operation on identical inputs and then taking the square root is the same as taking the norm. Matrix multiplication is equivalent to performing this operation on each row of the first matrix with each column of the second matrix. If this operation gives a result of 0, then at least one of the inputs is 0 or the inputs are perpendicular. Name this operation that is calculated by multiplying corresponding components of vectors and adding the results.	**dot** product [accept **scalar product**; accept **Euclidean inner product**; accept **dot**ting]

Question #30: Literature

10 points

One poem by this writer states "Toil conquered all, remorseless toil" and "Before all, worship the Gods." That poem, which is influenced by this poet's contemporary Varro [VAR-oh], begins by asking what makes the cornfield smile and is about agriculture. In another work by this writer, a queen kills herself by falling on her lover's sword while on a funeral pyre. This writer had that queen predict endless hate between her people and the Trojans. This author wrote that work about the son of Anchises [an-KY-seez] and the founding of Rome. Name this Roman poet of the *Georgics* and the *Aeneid*.	**Virgil** [or Publius **Vergil**ius Maro]

Question #31: Science

10 points

This device is not an interferometer but has laser and fiber optic types that use the Sagnac [sahn-yahk] effect. The vibrating structure and Coriolis vibratory types of this device are used in many portable electronic devices. These objects are often combined with accelerometers in inertial navigation systems to track motion. The moving parts of this object have simple relationships to its Euler [OY-lur] angles. This device has gimbals and a spinning rotor. Name this device that is used to demonstrate the conservation of angular momentum and has axes that can move around.	**gyroscope**s

Question #32: Social Studies

10 points

The poet Ebenezer Elliott wrote a book of hymns and a book of rhymes about these policies, which he hated. An organization that opposed these policies was part of the Manchester School and was started by John Bright and Richard Cobden. Henry Hunt spoke out against these policies in an event that turned into the Peterloo Massacre. David Ricardo opposed these laws, which no longer exist, based on his theory of comparative advantage. These laws were repealed by Robert Peel near the beginning of the Great Famine in Ireland. Name these tariffs and trade restrictions on food and grain in 19th-century Great Britain.	**Corn Laws** [prompt on **tariff**s]

Extra Question #1: Mathematics

10 points

The claim that there are infinitely many of these numbers is the simplest specific consequence of Polignac's [poh-lin-yahk'z] conjecture. Though it is not known whether there are infinitely many of these numbers, a related theorem by Yitang Zhang [yee-tahng zahng] could lead to a proof that there are. The sum of the reciprocals of these numbers converges to Brun's constant. All of these numbers except the first can be expressed as "6n plus or minus 1", where n is a whole number and the "plus or minus" gives both parts of the pair of these numbers. 5 is the only number that's a member of two different pairs of these numbers, since 3 and 5 are prime, and 5 and 7 are prime. Name these pairs of prime numbers that differ by 2.	**twin prime**s [accept **prime twin**s; propmt on **twin**s; do not prompt on "prime(s)" or "prime number(s)"]

Extra Question #2: Literature

10 points

In one novel by this writer, the protagonist imagines James Fulton walking with his mahogany cane when he was Dean of the Institute. That character does so in this author's novel when she sees that all of her predecessors at 125 Walker have been Empiricists, which she is not. In another novel by this writer, many of the characters try to keep away from a son of a blacksmith who is now a patroller. This author included many anachronisms in that novel, including a 12-story building and the title system, which is used by runaway slaves. Name this current American novelist who wrote *The Intuitionist* and *The Underground Railroad*.	Colson **Whitehead**

Extra Question #3: Fine Arts

10 points

Claude Vatin [vah-tan] claimed that this person created the *Dancers of Delphi* [DEL-fy], which is also known as the Acanthus Column. One work by this artist depicts a naked goddess holding a bath towel to her side and was built for the Temple at Knidos ["NIGH-dose"]. That work, like many others by this artist, was destroyed and re-created based on depictions of it. An extant work by this artist has a baby god resting on the arm of another god, though the larger god's other arm is now missing. Name this Attic sculptor who worked in Athens and created *Hermes* [HUR-meez] *and the Infant Dionysus* ["die"-oh-NY-suss].	**Praxiteles** [prak-SIT-uh-leez]

Extra Question #4: Science

10 points

This species used to be classified in the genus [JEE-nuss] *Pithecanthropus* [PITH-uh-KAN-throh-puss], which is no longer used. Recent findings in Saudi Arabia suggest that this species went extinct because it was too lazy to adapt to a changing environment. Most evidence points to this species being the first to control fire. *Homo heidelbergensis* ["hide"-ul-burg-EN-siss] used to be classified as a subspecies of this species, and there is some debate as to whether or not this species is the same as *Homo ergaster*. Peking Man and Java Man are famous examples of this species. Name this hominin whose name reflects the fact that they walked upright.	***Homo erectus*** [prompt on **Java Man**]

Extra Question #5: Social Studies

10 points

This country's Pueblo Viejo [PWEB-loh vee-AY-hoh] is one of the most productive gold mines in the world. Next to this country's town of Neyba is the very salty Lake Enriquillo [en-ree-KEE-yoh]. This country's capital used to be Santiago de los Caballeros [sahn-tee-AH-goh day lohss kah-by-YAIR-ohss]. Its current capital has a Colonial Zone that includes the Ozama Fortress built in 1502 and the Basilica Cathedral of Santa María la Menor, started in 1512. Many baseball players have come from this country's city of San Pedro de Macorís. This country is about 100 miles west of Puerto Rico. Name this country whose capital is Santo Domingo and that shares Hispaniola with Haiti.	**Dominican Republic** [or **República Dominicana**]

Extra Question #6: Literature

10 points per part

In this novel, Penny wants to kill a bear named "Old Slewfoot".		
1	Name this novel about Penny's son Jody Baxter, who takes care of a deer named Flag.	*The* ***Yearling***
2	*The Yearling* is by this author who later wrote the fantasy book *The Secret River*.	Marjorie (**Kinnan**) **Rawlings** [accept either underlined name]
3	Pa talks about why he did not shoot a deer in the woods in a chapter from one of this author's *Little House on the Prairie* series.	Laura **Ingalls** **Wilder** [accept either underlined name]

Extra Question #7: Literature

10 points per part

In this novel, Julie and Steve are almost arrested for being in an interracial marriage.		
1	Name this novel whose title vehicle is the *Cotton Blossom*.	***Show Boat***
2	This author had many of her works turned into musicals, including *Saratoga Trunk*, *The Royal Family*, *Giant*, and *Showboat*.	Edna **Ferber**
3	This writer, who like Ferber was a member of the Algonquin Round Table, wrote a sarcastic review of Ferber's *Ice Palace*. This author of the story "Big Blonde" and collection *Here Lies* was known for her biting wit.	Dorothy **Parker** [or Dorothy **Rothschild**]

Extra Question #8: Science

10 points per part

This phenomenon is not possible in classical mechanics but can happen in quantum mechanics.		
1	Name this phenomenon in which a particle passes through a barrier even though it does not have enough energy to do so.	quantum **tunneling**
2	Tuneling explains this type of radioactive decay, in which a particle with two protons and two neutrons is emitted.	**alpha** decay
3	This Soviet-American physicist used tunneling to explain alpha decay. The "factor" named for this person helps determine the likelihood of nuclear fusion.	George **Gamow** [or Georgiy Antonovich **Gamov**]

Extra Question #9: Science

10 points per part

This force deflects to the right in the northern hemisphere and to the left in the southern hemisphere.		
1	Name this fictitious force in rotating reference frames.	**Coriolis** force or **Coriolis** effect
2	The magnitude of the Coriolis effect is found by multiplying this number times velocity times angular velocity times the sine of latitude.	**2**
3	This parameter equals the ratio of inertial force to Coriolis force. This number is large in a tornado.	**Rossby** number [or **Rossby** parameter or **Kibel** number]