Illinois Masonic Academic Bowl
2020 Sectional Tournament

> Round 6 > 1st Section > Toss-up Questions

## Question \#1: Miscellaneous

10 points

An award established in this profession first went to Milton Brooks for his work Ford Strikers Riot. Soon after that, the award in this profession was given to Joe Rosenthal for his work during World War II. Much earlier, Roger Fenton did pioneering work in this profession during the Crimean War. The golden age of this profession took place after the development of the Leica ["LIKE-uh"] during the 1920s, which gave people more mobility. Some members of this profession brought attention to poor people, including John Thomson, Jacob Riis [reess], and Dorothea Lange [laynj]. Name this profession that has created works such as Jeff Widener's Tank Man and a portrait of Abraham Lincoln during the Civil War by Mathew Brady.
photojournalism or photojournalist(s)
[accept (war)
photography or (war)
photographer(s); prompt on journalism or journalist(s)]

## Question \#2: Literature

10 points
This character says of the word "peace" that "I hate
Tybalt [TIB-ult] the word, as I hate hell." This character is called "good king of cats" after he asks, "What wouldst thou have with me?". At a feast, this character states "It fits, when such a villain is a guest: I'll not endure him." He says those words shortly after saying "Fetch me my rapier [RAY-pee-ur], boy." Shortly after this character kills another character and flees, he returns to the scene and states "Thou, wretched boy, that didst consort him here, shalt with him hence", leading to this character's death. Name this nephew of Lady Capulet who kills Mercutio [mair-KYOO-shee-oh] and is killed by Romeo in William Shakespeare's Romeo and Juliet.

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## Question \#3: Science

10 points

| This element was used in the Kucherov | mercury [accept $\mathbf{H g}$ ] |
| :--- | :--- |
| [KOO-chuh-rawff] reaction in the hydration of |  |
| acetylene [uh-SEE-tuh-leen] before the use of |  |
| palladium [puh-LAD-ee-um] chloride in the Wacker |  |
| process. A combination of potassium, iodine, and |  |
| this element is used to detect ammonia as Nessler's |  |
| reagent. This element combines with sulfur to form |  |
| the mineral cinnabar [SIN-uh-bar]. Overexposure to |  |
| this element can cause Minamata disease, which is |  |
| why the use of thiomersal ["thigh"-uh-MUR-sawl] |  |
| in vaccines was controversial. Alloys of this element |  |
| are often used by dentists for patients over 15 years |  |
| old and are called amalgams. Name this element |  |
| that was known as quicksilver and is the only metal |  |
| that is liquid at room temperature. |  |

## Question \#4: Social Studies

10 points
This country underwent a "coup by memorandum" in 1971, and Kenan Evren led a more traditional coup in it in 1980. Much of what is now this country was split up after World War I by the Treaty of Sèvres [sev-ruh], but the modern version of this country was created soon afterward by the Treaty of Lausanne [loh-ZAHN]. This country's first prime minister and second president was Ismet Inönü [in-uh-NOO], who fought for its independence against several countries, including Greece. This country invaded Cyprus in 1974 and is the only country that recognizes the Republic of Northern Cyprus. Name this country whose founder was Mustafa Kemal Atatürk.
(Republic of) Turkey or
Türkiye (Cumhuriyeti)

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## Question \#5: Mathematics

10 points

| Girard's formula is used to find the areas of | sphere [accept ball before |
| :--- | :--- |
| triangles drawn on this shape's surface by relating | "equals"] |
| it to the "excess" of this shape. In the coordinate |  |
| system named for this shape, the equation "rho |  |
| equals a constant" generates this shape. This shape |  |
| has the smallest surface area for a given volume. In |  |
| Cartesian [kar-TEE-zhun] coordinates, the equation |  |
| " $x$ squared plus $y$ squared plus $z$ squared equals $r$ |  |
| squared"generates this shape. Name this |  |
| three-dimensional analogue of a circle. |  |

## Question \#6: Literature

10 points
This god shared his name with the ruler of the
Loki
Utgard Castle. This god killed Fimafeng
[FIM-ah-feng] after other gods complimented
Fimafeng and Eldir; soon after that, this god insulted Bragi [BRAHG-ee] and Othin [OH-thin]. This god turned Idunn [EE-dun] into a nut in order to rescue her from Thiazi in a story in which Thiazi takes the form of an eagle and this god takes the form of a falcon. This god and Heimdall [HYM-dahl] kill each other during Ragnarök. This god made an arrow or spear out of mistletoe to kill Baldr ["balder"]. This god is the father of Hel, Fenrir, and Jörmungandr [YOR-mun-gahn-dur] and the mother of Sleipnir [SLYP-neer]. Name this Norse trickster god.

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## Question \#7: Fine Arts

10 points per part

| A museum formerly called the National Museum <br> of American Art now has a name that makes its <br> association with this institution obvious. |  |  |
| :---: | :--- | :--- |
| $\mathbf{1}$ | Name this institution that oversees several <br> museums, many of which are on the National <br> Mall in Washington, D.C. Its largest museum is <br> the National Air and Space Museum. | Smithsonian Institution |
| $\mathbf{2}$ | This artist's Only One is at the Smithsonian <br> American Art Museum. It is one of her works <br> inspired by the perspective of riding an <br> airplane, such as Sky Above the Clouds. | Georgia (Totto) O'Keeffe |
| $\mathbf{3}$ | The Smithsonian American Art Museum shares <br> a building with this other part of the <br> Smithsonian Institution that displays works by <br> Gilbert Stuart and Shepard Fairey. | National Portrait |

## Question \#8: Fine Arts

10 points per part

| One of the first uses of motion pictures was by <br> Eadweard Muybridge [Edward MOY-bridge] to <br> determine whether all four feet of this animal were <br> off the ground at the same time when it ran. |  |  |
| :---: | :--- | :--- |
| $\mathbf{1}$ | Name this type of animal that is the defining <br> characteristic of an equestrian statue. | horse(s) |
| $\mathbf{2}$ | Etienne [et-yen] Maurice Falconet [fal-koh-nay] <br> used this material to make his equestrian statue <br> of Peter the Great in the Senate Square in <br> St. Petersburg. | bronze [prompt on <br> copper or metal] |
| $\mathbf{3}$ | This American artist, who often portrayed <br> cowboys and horses, made the sculpture The <br> Bronco Buster. | Frederic (Sackrider) <br> Remington |

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## Question \#9: Science

10 points per part

|  | don Glashow [GLASH-"ow"], Abdus Salam, Steven Weinberg explained how to unify this with electromagnetism. |  |
| :---: | :---: | :---: |
| 1 | Name this interaction that is responsible for radioactive decay. | weak nuclear force or interaction [accept electroweak] |
| 2 | These two letters are used for the bosons [BOH-zahnz] that mediate the weak interaction. | $\underline{\mathbf{W}}$ and $\underline{\mathbf{Z}}$ [either order] |
| 3 | This exchange of Z bosons was discovered at the Gargamelle bubble chamber at CERN [surn] and helps explain the unification of the weak interaction and electromagnetism. | neutral current |

## Question \#10: Science

10 points per part

| There are six of these elementary particles, <br> including the three neutrinos. |  |  |
| :---: | :--- | :--- |
| $\mathbf{1}$ | Name this class of particles, one of which is the <br> electron. | leptons |
| $\mathbf{2}$ | Neutrinos were first theorized to balance the <br> energy in this type of decay that either <br> produces an electron and an antineutrino <br> [pause] or a positron and a neutrino. | beta decay |
| $\mathbf{3}$ | Parity conservation states that changing the <br> signs of spatial coordinates does not change <br> outcomes. The lack of parity conservation was <br> demonstrated by the Wu experiment, which <br> measured the beta decay of this element. | cobalt-60 |

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## Question \#11: Social Studies

10 points per part

| The northeast corner of this country contains a part of Lagoon Mirim, which is mostly in Brazil. |  |  |
| :---: | :---: | :---: |
| 1 | Name this country whose capital is Montevideo [mohn-tay-vee-DAY-oh]. | (Oriental Republic of) Uruguay [or (República Oriental del) Uruguay] |
| 2 | The combination of the Uruguay and the Paraná Rivers forms this waterway south of Uruguay. | Río de la Plata [or La Plata River] |
| 3 | This river flows across Uruguay. It is dammed to form the Rincón del Bonete [reen-KOHN del boh-NAY-tay] Reservoir. | Río Negro [NAY-groh] or Negro River [prompt on Black River] |

## Question \#12: Social Studies

10 points per part

| The most populous inland city in this country is <br> Tampere [TAHM-puh-ray]. |  |  |  |
| :---: | :--- | :--- | :---: |
| $\mathbf{1}$ | Name this country north of Estonia whose <br> capital is Helsinki. | (Republic of) Finland [or <br> Suomi or Suomen <br> (tasavalta)] |  |
| $\mathbf{2}$ | This gulf separates Finland from Sweden. | Gulf of Bothnia <br> [BAHTH-nee-uh] |  |
| $\mathbf{3}$ | This is the northernmost region of Finland. Its <br> most populous city is Rovaniemi <br> [roh-vah-nee-EH-mee]. | Lapland [or Sápmi or <br> Lappi] |  |

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## Question \#13: Literature

10 points per part

| Name these late-20th-century and <br> early-21st-century Canadian writers. |  |  |
| :---: | :--- | :--- |
| $\mathbf{1}$ | This author wrote about the control of women <br> in the Republic of Gilead [GIL-ee-ud] in The <br> Handmaid's Tale. | Margaret (Eleanor) <br> Atwood |
| $\mathbf{2}$ | This Canadian author wrote about visiting his <br> native home of Sri Lanka in Running in the <br> Family. One of his novels is titled The English <br> Patient but is about a Hungarian who has been <br> badly burned. | (Philip) Michael <br> Ondaatje |
| $\mathbf{3}$ | This author explored gender roles in a story <br> about a girl whose father was a fox farmer. In <br> addition to "Boys and Girls", this author wrote <br> the story "Free Radicals" about Nita, who <br> pretends to be Bett when a murderer is in her <br> house. | Alice (Ann) Munro <br> [accept Alice Ann <br> Laidlaw] |

## Question \#14: Literature

10 points per part

| The protagonist of this novella has written an <br> "epic prose poem about the life of Frederick the <br> Great". |  |  |  |
| :---: | :--- | :--- | :---: |
| $\mathbf{1}$ | Name this novella in which Gustav von <br> Aschenbach [AH-shen-bahk] becomes fascinated <br> with Tadzio. | Death in Venice [or Der <br> Tod in Venedig] |  |
| $\mathbf{2}$ | This German author wrote Death in Venice as <br> well as The Magic Mountain. | (Paul) Thomas $\underline{\text { Mann }}$ <br> [toh-mahss mahn] |  |
| $\mathbf{3}$ | In The Magic Mountain, Hans Castorp leaves <br> Hamburg to visit his cousin in this city. | Davos(-Platz, Grisons, <br> Switzerland) |  |



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## Question \#15: Science

10 points

The quantity of these molecules is measured using luciferase ["Lucifer-ace"] and luminometers [loo-muh-NAH-muh-turz], which is done to determine whether surfaces are hygienic. 22 of these molecules are created by breaking up a ketone ["key-tone"] body. This molecule is used during primary active transport. The use of hexokinase ["hex"-oh-KY-nayss] breaks this molecule up at the beginning of glycolysis [gly-KAH-luh-siss], and the use of pyruvate kinase ["pie"-ROO-vayt KY-nayss] yields pyruvate and this molecule at the end of glycolysis [gly-KAH-luh-siss]. The electron transport chain forms a proton gradient that drives production of this molecule. Name this energy-carrying molecule used in all living cells that is produced in mitochondria
["my-toe-CON"-dree-uh].

ATP [or adenosine triphosphate]

## Question \#16: Social Studies

10 points

This person wrote the books It Changed My Life and The Second Stage. In 1966, this person and Pauli Murray wrote the "Statement of Purpose" for an organization that this person became the first president of. Another book by this person was inspired by a survey of people who had graduated from Smith College 15 years earlier; that book describes "the problem that has no name". In 1970, this person organized the Women's Strike for Equality. Name this first leader of the National Organization for Women and author of The Feminine Mystique.

Betty Friedan [or Bettye Goldstein]

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## Question \#17: Fine Arts

10 points

This composer showed his support for Shriners with the song "Nobles of the Mystic Shrine". His general support of Freemasonry can be seen by his dedication of "The Thunderer" to a Knights Templar commander and his naming of another piece "The Crusader". In support of an essay contest, this composer wrote a piece called "The Washington Post". The last four U.S. presidential inaugurations have featured this composer's "The Liberty Bell". One of his compositions has a piccolo obbligato [ohb-lee-GAH-toh] that represents the southern part of the United States. Name this composer whose piece "The Stars and Stripes Forever" is the official national march of the United States.

John Philip Sousa


[^0]
 United

## Question \#18: Literature

10 points

| The protagonist of this novel says "There's no | Catch-22 |
| :--- | :--- |
| patriotism, that's what it is. And no matriotism, |  |
| either." That statement is made in response to a |  |
| character in this novel who tries to increase his |  |
| lifespan by cultivating boredom, Dunbar. Another |  |
| character in this novel mentions "The syndicate I'd |  |
| like to form someday so that I can give you men the |  |
| good food you deserve". That character is Milo |  |
| Minderbinder. This novel is set on the island of |  |
| Pianosa [pee-ah-NOH-zah] during World War II |  |
| and is about bombers such as Yossarian. Name this |  |
| novel by Joseph Heller. |  |

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## Question \#19: Science

10 points
Some organisms that feed on this compound use the ribulose ["RYE"-byoo-lohss] mono-phosphate cycle for formaldehyde assimilation. Those organisms often grow in rice paddies, where large amounts of this compound are produced naturally by the waterlogged soil. Bacteria in the guts of certain animals, including termites, produce this compound. Much of this compound exists inside a lattice of water molecules in clathrates [KLATH-"rates"] beneath sea beds and in permafrost. This compound, which is over 20 times more potent than carbon dioxide as a greenhouse gas, is the primary component of natural gas. Name this compound whose chemical formula is $\mathrm{CH}_{4}$.
methane [accept $\mathrm{CH}_{4}$ before the end]

## Question \#20: Social Studies

10 points
In Corfu, on the day before this holiday, people smash pots by throwing them out of windows. On this holiday in Florence, the archbishop lights a dove-shaped rocket that sets off the Explosion of the Cart. In the Eastern Orthodox Church, this holiday begins Bright Week, and it is not allowed to occur before the Jewish people celebrate Passover. Many Eastern Orthodox Church members call this holiday Pascha [PAH-skuh]. This holiday begins a 50-day period that ends with Pentecost. This holiday is just after Holy Week at the end of Lent. Name this holiday during which Christians celebrate the Resurrection.

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Round 6<br>4th Section Teamwork Questions

## Question \#21: Mathematics

10 points per part
For a logarithmic function, this set is usually the positive real numbers.

| $\mathbf{1}$ | Give this term for the set of possible values of <br> the input variable to a function. It is often <br> contrasted with the range. | domain [do not accept or <br> prompt on "codomain"] |
| :---: | :--- | :--- |
| $\mathbf{2}$ | For this type of function, each element of the <br> domain corresponds to a different element of <br> the range. Functions with this property do not <br> need to be surjective, but they can be. | one-to-one or injective <br> function or $\underline{\text { injection }}$ |
| $\mathbf{3}$ | Find the smallest positive value, in radians, <br> that cannot be in the domain of the function " $f$ <br> of $x$ equals 2 plus the tangent of the quantity <br> $5 x "$. | pi/10 or $\mathbf{1 / 1 0 ~ p \mathbf { p i }}$ [do not <br> accept or prompt on <br> partial answers] |

## Question \#22: Mathematics

10 points per part

| It's relatively convenient to write the equation of a <br> cardioid ["CARD"-ee-oyd] in this coordinate <br> system. |  |  |
| :---: | :--- | :--- |
| $\mathbf{1}$ | Name this coordinate system in which each <br> point is specified using the distance from the <br> origin and the angle with the positive half of <br> the $x$-axis. | polar coordinate system <br> or polar coordinates |
| $\mathbf{2}$ | In polar coordinates, graphing the equation " $r$ <br> squared equals the cosine of 2 theta" produces <br> this shape. | lemniscate <br> [LEM-nuh-"skate"] of <br> Bernoulli [prompt on <br> figure '8'] |
| $\mathbf{3}$ | Find the area enclosed in the graph of the polar <br> equation " $r$ equals $5 "$. | $\underline{\mathbf{2 5} \text { pi [do not prompt on }}$partial answers] |

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## Question \#23: Literature

10 points per part

| At the beginning of this novel, the characters are <br> upset because they are facing a giftless Christmas. |  |  |
| :---: | :--- | :--- |
| $\mathbf{1}$ | Name this novel in which the protagonists are <br> the daughters of a Union Army chaplain and a <br> person often referred to as "Marmee". |  |
| $\mathbf{2}$ | In Little Women, Beth wants one of these <br> objects, which she eventually gets from <br> Mr. Laurence. | piano(s) [prompt on <br> musical instruments] |
| $\mathbf{3}$ | This author wrote Little Women. | Louisa May Alcott |

## Question \#24: Literature

10 points per part

| The protagonist of this play asks "Why you got <br> the white mens driving and the colored lifting?". |  |  |  |
| :---: | :--- | :--- | :---: |
| $\mathbf{1}$ | Name this play about the first <br> African-American truck driver in Pittsburgh, <br> whose name is Troy Maxson. | Fences |  |
| $\mathbf{2}$ | In Fences, what type of instrument does Troy <br> Maxson's brother play? | trumpet [prompt on <br> horn] |  |
| $\mathbf{3}$ | Name the playwright of Fences. It is one of his <br> ten plays in a cycle set in Pittsburgh during <br> each decade of the 20th century. | August Wilson [or <br> Frederick August Kittel <br> Jr.] |  |

# Round 6 <br> 4th Section Teamwork Questions 

## Question \#25: Science

10 points per part

| This principle states that the proportion of <br> dominant and recessive genes remains the same <br> across generations. |  |  |
| :---: | :--- | :--- |
| $\mathbf{1}$ | Identify this principle named for an English <br> mathematician and German doctor. | Hardy-Weinberg <br> principle or law or <br> equilibrium or theorem |
| $\mathbf{2}$ | The Hardy-Weinberg principle was designed for <br> organisms with this chromosome property, <br> meaning that each cell has two copies of each <br> chromosome-one from each parent. | $\underline{\text { diploidy }}$ |
| $\mathbf{3}$ | This effect, named for a Swedish geneticist, <br> states that the number of heterozygous <br> organisms decreases over time because of <br> population subdivisions. | Wahlund effect |

## Question \#26: Science

| Females have one of these in most of their cells, <br> while most males have none. |  |  |
| :---: | :--- | :--- |
| $\mathbf{1}$ | Name these deactivated X chromosomes. | $\underline{\text { Barr body/ies }}$ |
| $\mathbf{2}$ | This RNA gene plays a major role in <br> deactivating Barr bodies once this gene is <br> spliced by coating the X chromosome. | $\underline{\underline{\text { Xist or }} \underline{\text { X-inactive }}}$ |
| $\mathbf{3}$ | Xist is this type of RNA gene that is not <br> translated into proteins. Both tRNA and rRNA <br> fit into this category. | $\underline{\underline{\text { ncn-coding RNA }}}$ |

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## Round 6 <br> 4th Section <br> Teamwork Questions

## Question \#27: Social Studies

10 points per part

| This period lasted from about 1946 to 1990. |  |  |
| :---: | :--- | :--- |
| $\mathbf{1}$ | Name this time during which there was tension <br> between the United States and Soviet Union, <br> but no full-scale fighting between them. | Cold War |
| $\mathbf{2}$ | This agreement-officially called the Treaty of <br> Friendship, Cooperation and Mutual <br> Assistance -was signed by the Soviet Union <br> and its allies in 1955 after West Germany <br> joined NATO. | Warsaw Pact |
| $\mathbf{3}$ | This American diplomat supported a policy of <br> containment towards the Soviet Union with his <br> "Long Telegram" and his anonymous article <br> The Sources of Soviet Conduct. | George (Frost) Kennan |

## Question \#28: Social Studies

10 points per part
The Second Bank of the United States was given a charter from 1816 to 1836 . When that time ended, it briefly became private before folding.

| $\mathbf{1}$ | In 1832, this president vetoed the bill to <br> re-charter the bank. | Andrew Jackson |
| :---: | :--- | :--- |
| $\mathbf{2}$ | The Second Bank of the U.S. was supported by <br> this 1819 Supreme Court decision that <br> protected the bank from a state tax. | McCulloch v. Maryland <br> [prompt on Maryland] |
| $\mathbf{3}$ | The combination of the bank going private and <br> this Jackson executive order are blamed for the <br> Panic of 1837. This executive order required <br> public lands to be paid for with gold or silver. | Specie Circular |

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Round 6<br>5th Section Toss-up Questions

## Question \#29: Literature

10 points

| This character is given the choice of running the | Candide [kan-deed] |
| :--- | :--- |
| gauntlet 36 times or having his brains blown out |  |
| with a dozen musket-balls. When he is about to be |  |
| killed, this character is pardoned by the king of the |  |
| Bulgarians. This person then sees a beggar covered |  |
| with scabs who turns out to be his former teacher, |  |
| who claims to have picked up a disease from |  |
| Pacquette [pak-ET]. This character ultimately |  |
| decides that we should all "cultivate our garden". |  |
| When he is young, this person is taught that he |  |
| lives in the "best of all possible worlds". This |  |
| character loves Cunégonde ["cue"-neh-gawnd] and |  |
| is taught by Dr. Pangloss. Name this title character |  |
| in a novel by Voltaire. |  |

## Question \#30: Mathematics

10 points
This value is in the denominator of each equation in Vieta's formulas to find roots. Factors of this number are the denominators in the rational root theorem. If a rational function has the same degree in the numerator and denominator, then the limit as $x$ approaches infinity is the ratio of the two values of this quantity. If this quantity is positive, then the limit of a polynomial is positive infinity as $x$ approaches infinity, though the limit as $x$ approaches negative infinity depends on both this value and the polynomial degree. Name this number placed before the highest-degree term of a polynomial.
leading coefficient [prompt on coefficient; accept first coefficient; before "highest-degree", accept coefficient of the highest-degree term or coefficient of the highest-order term]

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## Question \#31: Social Studies

10 points

It is believed that this leader died just before the Šuppiluliumas [soop-uh-loo-lee-OO-muhz] attacked the Mitanni [mih-TAN-ee], so his army did not protect Tushratta [tush-RAH-tah], whom this leader and his father often corresponded with. This leader had six daughters by his primary wife, and he had many consorts, at least one of whom had a son who succeeded him. This leader's son moved the capital to Memphis a few decades after this leader moved it to what is now Amarna. This leader was the father of Tutankhamun [too-tahnk-HAH-mun] and husband of Nefertiti [neff-ur-TEE-tee]. Name this pharaoh who temporarily moved Egypt towards monotheism through his worship of Aten [AH-tun].

Akhenaten or
Amenhotep IV [prompt on Amenhotep]

## Question \#32: Science

10 points

| This quantity is not density, but the bulk modulus <br> is defined as the opposite of this quantity times the | volume [accept displaced |
| :--- | :--- |
| rolume after "buoyant"] |  |
| quantity. The amount this quantity changes is |  |
| equal to 3 times this quantity times the linear |  |
| coefficient of thermal expansion times the change in |  |
| temperature. The amount of buoyant [BOY-unt] |  |
| force is calculated by multiplying this quantity |  |
| times density and gravitational field strength. |  |
| Enthalpy equals a system's internal energy plus the |  |
| product of its pressure and this quantity. The |  |
| density of a 3D object equals its mass divided by |  |
| this quantity. Name this quantity that can be |  |
| measured in liters. |  |

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Round 6<br>Extra Section Toss-up Questions

## Extra Question \#1: Social Studies

10 points

| This politician said "In the name of the greatest | George C(orley) Wallace |
| :--- | :--- |
| people that have ever trod this earth, I draw the | (Jr.) |
| line in the dust and toss the gauntlet before the |  |
| feet of tyranny." Because his state's constitution |  |
| prevented governors from holding office for |  |
| consecutive terms, this person was succeeded by his |  |
| wife Lurleen after his first term. When Arthur |  |
| Bremer was unable to assassinate Richard Nixon, |  |
| he shot this person instead, leaving him paralyzed. |  |
| This person carried five states running for the |  |
| American Independent Party in the 1968 Election. |  |
| Name this governor of Alabama who supported |  |
| "segregation now, segregation tomorrow, |  |
| segregation forever". |  |

## Extra Question \#2: Science

10 points
Hydroxides ["hide-ROCK-sides"] of this element are commonly used to make soft soap. The transport of ions of this element in the body is hindered when apamin [AP-uh-min] from bee stings binds to calcium-activated channels, which is why bee stings are toxic. The English name of this element comes from the fact that it is derived from a mineral created by soaking the ashes of a plant. The nitrate of this element is used in gunpowder. Comparisons of the abundance of an isotope of this element to an isotope of argon are often used to date rocks. Name this alkali metal that in German is called "kalium" and which has the chemical symbol "K".
potassium [accept $\underline{\mathbf{K}}$ before the end]

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## Extra Question \#3: Fine Arts

10 points

The top of one painting by this artist shows a circle of angels whose outfits are alternating white, pink, and green, while the bottom of that painting shows three angels embracing three men. That painting is The Mystical Nativity. The top of another painting by this artist depicts a blindfolded Cupid, apparently aiming his arrow at the Three Graces. The right side of that painting depicts Chloris [KLOR-iss] and Zephyrus [ZEFF-ih-russ], while this artist placed Mercury on the left side. Another painting by this artist depicts a Hora about to put clothes on a goddess, who has just come to shore and is standing in a shell. Name this Florentine painter of Primavera and The Birth of Venus.

Sandro Botticelli
[boh-tee-CHEL-ee] [or
Alessandro (di Mariano)
Filipepi]

## Extra Question \#4: Mathematics

10 points
According to an identity named for Leonhard Euler
four [OY-lur], if two numbers are each a sum of this many perfect squares, then their product is also a sum of this many squares. William Rowan Hamilton developed a number system in which each number is defined by this many components. The Platonic solid with the fewest number of faces has this many faces. If a shape has this many sides, then its internal angle measures add up to 360 degrees. Identify this number of sides of a quadrilateral.


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Round 6<br>Extra Section Toss-up Questions

## Extra Question \#5: Literature

10 points

| One novel by this author is narrated by a survivor | H(erbert) G(eorge) Wells |
| :--- | :--- |
| of the Lady Vain, which collided with another boat. |  |
| In that novel, this author has the narrator, Edward |  |
| Prendick, taken to a place inhabited by a doctor |  |
| who is infamous for his vivisection |  |
| [VIV-ih-"section"] experiments. In another novel by |  |
| this author, the narrator saves Weena from |  |
| drowning when nobody else will, and she puts two |  |
| strange white flowers in his pocket. This author |  |
| later describes Weena being lost in a forest fire in a |  |
| fight against the Morlocks. Weena is an Eloi |  |
| [EE-loy]. Name this English author of The Island of |  |
| Doctor Moreau and The Time Machine. |  |

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## Round 6 <br> Extra Section <br> Teamwork Questions

## Extra Question \#6: Mathematics

10 points per part

| This adjective describes the smallest possible circle or sphere that encloses a given shape. |  |  |
| :---: | :---: | :---: |
| 1 | Name this term that describes a circle which often touches each vertex of a polygon. | circumscribed circle or sphere [accept circumscribing circle or sphere] |
| 2 | If the area of a square is 16 , find the area of the circle that circumscribes it. | 8 pi [do not prompt on partial answers] |
| 3 | If the length of the main diagonal of a cube is 6 , find the surface area of the sphere that circumscribes it. | 36 pi [do not prompt on partial answers] |

## Extra Question \#7: Mathematics

10 points per part

| For a pyramid, this distance is measured along the <br> center of a face that is not the base. |  |  |
| :---: | :--- | :--- |
| $\mathbf{1}$ | Give the two-word name for this line segment. <br> For a cone, it is the distance from a point on <br> the base circle to the apex. | $\underline{\text { slant height }}$ [do not <br> prompt on partial answers] |
| $\mathbf{2}$ | Find the slant height of a cone whose radius <br> measures 3 units and whose height is 4 units. | $\underline{\mathbf{5}}$ units |
| $\mathbf{3}$ | Find the total surface area for the same cone, <br> with a radius of 3 units and a height of 4 units. | $\underline{\mathbf{2 4}}$ pi square units |

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## Extra Question \#8: Social Studies

10 points per part

| When this country was under French control, it <br> was called Saint-Domingue [san doh-meeng]. Then <br> it gained independence through a revolution led <br> by former slaves. |  |  |
| :---: | :--- | :--- |
| $\mathbf{1}$ | Name this country on the island of Hispaniola <br> in the Caribbean Sea. | (Republic of) Haiti [or <br> (République d') Haiti] |
| $\mathbf{2}$ | This leader of the Haitian revolution was <br> named Governor-General for Life in 1801, but <br> was removed from office in 1802. | Toussaint Louverture [or <br> Toussaint Bréda] |
| $\mathbf{3}$ | Shortly after the revolution, Haiti was split into <br> two nations, with Alexandre Pétion [pet-yaw] <br> ruling the south and this person ruling the <br> north until he died by suicide in 1820. This <br> person took on the name King Henry I. | Henri Christophe <br> [awn-ree kree-stawff] |

## Extra Question \#9: Social Studies

10 points per part

| This leader was the son of Pepin the Short and father of Louis the Pious. |  |  |
| :---: | :---: | :---: |
| 1 | Name this king of the Franks who, in 800, became the first Holy Roman Emperor. | Charlemagne [or Charles the Great or Charles I or Carolus Magnus; prompt on Charles or Carolus] |
| 2 | When Charlemagne became king of the Franks, he first co-ruled with this man who was his brother and who died three years later. | Carloman I |
| 3 | Charlemagne was briefly married to Desiderata [deh-see-duh-rah-tuh], a daughter of the leader of these people. With the support of Pope Adrian I, Charlemagne conquered these people. | Lombards or Lombardy |


[^0]:    

