



Illinois Masonic Academic Bowl
2016 Sectional Tournament

Round 7
1st Section
Toss-up Questions

Question #1: Social Studies – U.S. History

10 points

This person's visit to the White House was the backdrop for Scott Joplin's *A Guest of Honor*. This person was derided as the "Great Accommodater" after he implored listeners to "cast down their buckets", and he claimed a factory-earned dollar was worth more than one spent on opera. That speech was called the Atlanta Compromise. This person was hired away from the Hampton Institute in 1881 to become principal of a new school in Alabama. Name this author of *Up From Slavery* who started the Tuskegee Institute and was a rival of W. E. B. Du Bois [doo boyss].

Booker T(aliaferro)
Washington

Question #2: Science – Health

10 points

These problems are commonly caused by *Streptococcus mutans* [STREP-tuh-kah-kus MYOO-tuns], which can survive in an acidic environment and can convert sugars into dextran and lactic acid. These problems can be classified as smooth-surface or as pit-and-fissure. These problems usually only occur in the **cementum** [suh-MEN-tum] in older people because of protection from the **periodontium** [PAIR-ee-oh-DAH-N-shum]. These problems more typically involve demineralization of enamel. The incidence of these problems are reduced by water fluoridation. Name these problems, often treated with fillings, that involve the breaking down of teeth.

dental **caries** [or **cavity**/ies;
accept **tooth decay** and
prompt on **decay**]



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Question #3: Literature – Grammar/Usage

10 points

In his Chinese room theory, John Searle argued that this concept “is neither constitutive nor sufficient for semantics”. Contextual inflection is dictated by this concept, while inherent inflection is not. The theory of transformational-generative grammar was refined in *Aspects of the Theory of* this concept, which was written by Noam Chomsky. Dependency grammar does not recognize categories of it, such as parts of speech. Name this term for the rules that govern a language’s sentence structure.

syntax

Question #4: Social Studies – Religion

10 points

In the book of the Bible named for this person, the servants who eat nothing but vegetables for ten days look healthier than the young men who eat the royal food. This person predicted the rise of **Darius the Mede** [duh-RY-us “the” MEED] after one king was weighed and found wanting. This man was the companion of **Shadrach** [SHAD-rahk], **Meshach** [MEE-shak], and **Abednego** [uh-BED-nuh-goh], who are thrown into a fiery furnace. This person interpreted the dreams of **Nebuchadnezzar** [neb-uh-kud-NEZ-ur]. Name this Old Testament prophet who was thrown into a lions’ den.

Daniel [may be pronounced dah-nee-EL]



Question #5: Miscellaneous – Technology

10 points

Following a complaint by Sun about this company's licensing practices, the European Commission fined this company multiple times for antitrust violations. In 2008, this company pulled out of a major deal to buy Yahoo, but in 2011 it spent 8.5 billion dollars to purchase Skype. Its mobile division was established after it formed a partnership with Nokia. Its brand names include HoloLens, Surface, and Xbox. Name this tech giant, founded by Paul Allen and Bill Gates, that created the Windows operating system.

Microsoft Corporation

Question #6: Science – Chemistry

10 points

This ion has an equal ranking on the **Hofmeister** [HAWF-"my"-stir] series with fluorine, which is why its **ammonium** [uh-MOH-nee-um] salt is used for "salting out" proteins. Gilbert Lewis proposed that this **anion** [AN-"eye"-on] contains no double bonds, but rather single bonds and a central atom with a formal charge of **2+** ["two plus"]. This ion joins with magnesium in Epsom salt, and is paired with calcium in **gypsum** [JIP-sum]. The contact process is used to make a compound equivalent to two hydrogens bonded to this ion, sulfuric acid. Name this anion whose formula is **SO₄²⁻** ["S O four, two minus"].

sulfate ion [before beginning to state the formula at the end, accept **SO₄²⁻** or **SO₄⁻²**]



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2nd Section
Teamwork Questions

Question #7: Mathematics – Algebra

10 points per part

When considering solutions to the equation x minus three, quantity squared, equals zero, you might say that the solution is “three, with a <i>this</i> of two”.		
1	Give this term used to measure a repeated root or factor.	(algebraic) <u>multiplicity</u> [prompt on <u>multiple</u>]
2	Find the only unique factor of x cubed, plus nine x squared, plus twenty-seven x , plus twenty-seven. Keep in mind that this is an expression, not an equation.	<u>$x+3$</u> [or <u>$3+x$</u> ; allow answers that also state it is cubed or raised to the third power]
3	Give the only root of that polynomial; again, it is x cubed, plus nine x squared, plus twenty-seven x , plus twenty-seven.	$x = $ <u>-3</u>

Question #8: Mathematics – Algebra

10 points per part

The graph of this type of function is a horizontal line.		
1	Name this type of linear function, which can be expressed as f of x equals a number.	<u>constant</u> function
2	What is the slope of a constant function?	<u>zero</u> [do not accept “no slope” or “undefined”]
3	How many distinct values are in the range of a constant function?	<u>one</u>



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2nd Section
Teamwork Questions

Question #9: Fine Arts – Jazz

10 points per part

This singer called her autobiography <i>Lady Sings the Blues</i> .		
1	Name this jazz singer who struggled with heroin addiction and died from cirrhosis [sur-OH-sis] of the liver at the age of 44.	Billie Holiday [or Eleanora Fagan]
2	Billie Holiday performed and co-wrote this song that says, “Mama may have, Papa may have.”	“ God Bless the Child ”
3	Billie Holiday also performed and co-wrote this song narrated by a woman who allows her cheating lover to return. Its title follows the words, “Hush now.”	“ Don’t Explain ”

Question #10: Fine Arts – Jazz

10 points per part

Bernie Hanighen added lyrics to this song, which states “It begins to tell” at the title time.		
1	Name this song that was used as a title track in a 1986 film starring Dexter Gordon.	’Round Midnight [accept ’Round About Midnight]
2	<i>’Round Midnight</i> was written by this jazz pianist, who also wrote “Straight, No Chaser”.	Thelonious (Sphere) Monk
3	This musician featured the song “’Round Midnight” on his first album at Columbia Records, <i>’Round About Midnight</i> . His later albums with Columbia included <i>Kind of Blue</i> and <i>Sketches of Spain</i> .	Miles (Dewey) Davis (III)



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Teamwork Questions

Question #11: Social Studies – World History

10 points per part

The mobility of liburna [lih-BUR-nuh] compared to quinneremes [KWIN-kwuh-reemz] proved decisive in this battle, as did the defection of Quintus Dellius.		
1	Name this battle in the Ionian Sea, whose first attack was launched by Gaius Sosius [“GUY”-us SOH-shus] from the losers’ left side.	Battle of Actium
2	The victorious leader at Actium, Marcus Agrippa, became the son-in-law of this founder of the Roman Empire.	Augustus Caesar [or Gaius Octavius or Gaius (Julius Caesar) Octavianus]
3	Following defeat at Actium, these two lovers fled to Egypt; both committed suicide after another defeat at Alexandria.	Marc Antony [or Marcus Antonius] and Cleopatra VII Philopator [either order]

Question #12: Social Studies – World History

10 points per part

A former cook for the King’s African Rifles, this dictator shelled the palace of King Mutesa [moo-TAY-suh] II on the orders of Prime Minister Milton Obote [oh-BOH-tay].		
1	Name this strongman who seized power from Obote in 1971 after the prime minister left for a trip to Singapore.	Idi Amin [EE-dee ah-MEEN] (Dada)
2	Idi Amin thus took power in this country. Historians disagree as to whether he was born in this country’s capital, Kampala [kum-PAH-luh].	(Republic of) Uganda [or Jamhuri ya Uganda]
3	Idi Amin’s fall from power was spurred by a failed invasion of this neighboring nation, led by Julius Nyerere [nee-uh-RAIR-ay], in an effort to take over Kagera [kah-GAIR-uh].	Tanzania



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Question #13: Science – Chemistry

10 points per part

The Pauling scale is one way to define this quantity.		
1	Name this value that describes how strongly an atom attracts electrons. Differences in this quantity can be used to determine if a bond will be ionic or covalent [koh-VAY-lint].	<u>electronegativity</u>
2	On the Pauling scale, this element has the highest electronegativity: 4. It is the lightest halogen.	<u>fluorine</u> [accept F]
3	The Allred-Rochow definition of electronegativity uses this quantity, sometimes symbolized “Z eff”. This quantity is calculated with consideration of shielding due to inner electrons.	<u>effective nuclear charge</u> [do not accept or prompt on partial answers]

Question #14: Science – Chemistry

10 points per part

At standard temperature and pressure, it is a diatomic [“DIE-atomic”] gas with a triple bond.		
1	Name this gas, the most abundant component of the Earth’s atmosphere.	<u>nitrogen</u> [or dinitrogen ; or N₂]
2	Nitrogen gas is produced in the Wolff-Kishner reduction, where its source is this compound used in rocket fuel. Its formula is N₂H₄ [“N two, H four”].	<u>hydrazine</u> [“HIGH”-druh-zeen]
3	This compound is formed from nitrogen and hydrogen gases in the Haber process. It is commonly used in fertilizers, and its formula is NH₃ [“N H three”].	<u>ammonia</u> [do not accept “ammonium”]



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3rd Section
Toss-up Questions

Question #15: Literature – U.S. Literature

10 points

In this story, one character “would have been a good woman, if it had been somebody there to shoot her every minute of her life”. That character touched a man on the shoulder before being hit by three bullets in the chest. In this story, the cat Pitty Sing caused an accident, after which John Bailey and his family encounter a group of criminals. The grandmother in this story wants to travel to Tennessee instead of Florida. Name this Flannery O’Connor story in which a family is killed by the Misfit.

“A Good Man is Hard to Find”

Question #16: Fine Arts – Art History

10 points

One painting by this artist is based on Leonardo’s *Madonna and Child with Flowers* and is nicknamed for the flowers symbolizing marriage held by Mary and the baby Jesus. A painting by this artist similar to the *Mona Lisa* shows a woman holding a little unicorn. This person and his assistants painted the Stanza della **Segnatura** [sen-yah-TOO-rah] and three other rooms for the Vatican. One fresco in that room, which shows the Trinity above theologians arguing about transubstantiation, is *La Disputa* [lah dees-POO-tah]. Name this painter who depicted Plato, Aristotle, and several other great thinkers in his *School of Athens*.

Raphael [or **Raffaello** or **Sanzio** or **Raffaello Sanzio da Urbino**]



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Round 7
3rd Section
Toss-up Questions

Question #17: Mathematics – Math Concepts

10 points

This mathematical term can refer to the transformation of a point relative to a circle by dividing the radius squared of the circle by the distance of the point from the circle center. This term also refers to changing the proposition “If P, then Q” to “If not P, then not Q.” If this operation is performed on a square matrix, then multiplying the new matrix by the original gives an identity matrix. This operation can be performed on functions that are both one-to-one and onto; for instance, this operation applied to the function “ x cubed” gives “the cube root of x ”. Name this operation whose “multiplicative” type is equivalent to taking the reciprocal.

inversion [or **inverting** or **inverse**]

Question #18: Social Studies – U.S. Government

10 points

The Supreme Court overturned Anthony Cramer’s conviction for this crime, ruling that buying drinks was not a sufficient act. Enlistment of persons to commit this crime is not sufficient for a conviction, according to the majority opinion in *Ex parte Bollman*, which concerned a man who recruited people for the Burr-Wilkinson Plot. This crime is mentioned before bribery and high crimes and misdemeanors as an impeachable offense in the Constitution. Name this act of levying war against, or giving aid and comfort to, enemies of the United States.

treason



Question #19: Science – Physics

10 points

In an equation describing these devices, the reciprocal of a characteristic length is proportional to n minus one times various terms containing the two radii that define one of these structures. The power of one of these devices is measured in **diopters** [**“die”-AHP-turz**]. One of these devices named for **Fresnel** [**fruh-NEL**] is commonly used in lighthouses. Chromatic aberrations can occur in these devices. Like mirrors, they can be concave or convex, and they create images that are real or virtual depending on their distance from the focal point. Name these devices that focus light refracting through them, and which are often made of glass.

lens

Question #20: Literature – Mythology

10 points

This god’s **trishula** [**trih-SHOO-lah**] symbolizes the past, present, and future. During the churning of the ocean, this god swallowed **halahala** [**HAH-lah-HAH-lah**], whose presence in his throat led to the epithet “**Neelakantha** [**nee-lah-KAHN-thah**]”. This god cursed the **ketaki** [**keh-TAH-kee**] flower after it conspired with Brahma in a contest with Vishnu, which involved a lingam. Ganesh was decapitated by this god for refusing his demand to see his wife, Parvati. Name this Hindu destroyer god, a member of the trimurti along with Brahma and Vishnu.

Shiva [or **Siva**; prompt on **Mahadeva**]



Question #21: Social Studies – Economics

10 points per part

In <i>The Nature of Rent</i> , this person described the rent as the difference in productivity for plots of land.		
1	Name this writer of “Essay on the Principle of Population”, who warned about the arithmetic growth of resources in contrast to the geometric growth of population.	Thomas <u>Malthus</u>
2	Malthus opposed these laws, since he argued that they inhibited labor mobility, instead advocating for “indoor relief” where the “fare should be hard”.	English <u>Poor</u> Laws [accept <u>Old Poor</u> or <u>New Poor</u> Law or <u>Poor Law Amendment Act</u> of 1834]
3	Thomas Malthus clashed with David Ricardo over these British laws regarding a certain crop. Robert Peel oversaw their repeal, and the subsequent defeat of the Irish Coercion bill led to his resignation.	<u>Corn</u> Laws

Question #22: Social Studies – Economics

10 points per part

In this kind of market, the Herfindahl-Hirschman index is 10,000.		
1	Name this market structure in which there is a single seller.	<u>monopoly</u> [do not accept “monopolistic competition”]
2	Monopolies can result from high barriers to entry, such as these expenses that are independent of the amount of output. Common examples include building and land leases.	<u>fixed</u> costs
3	In a monopoly, deadweight loss occurs because of the monopolist setting marginal revenue equal to marginal cost so as to maximize this value.	<u>profit</u>



Question #23: Science – Biology

10 points per part

These proteins can diversify via V(D)J [V-D-J] recombination.		
1	Name these y-shaped proteins that bind to antigens [AN-tih-jinz] .	<u>antibodies</u> [or <u>immunoglobulins</u> or <u>antibody</u>]
2	Antibodies are released from these lymphocytes [LIM-foh-“sites”] , which develop in the bone marrow and are commonly contrasted with T cells.	<u>B</u> cells
3	The immune system recognizes cells by antigens, as well as these glycoproteins [GLY-koh-“proteins”] that are classified as class one and class two. These are used to distinguish the self from the non-self.	<u>MHC</u> [or <u>major histocompatibility complex</u>]

Question #24: Science – Biology

10 points per part

These structures contain hydrogen bonds between every four units.		
1	Name these structures that, along with beta-pleated sheets, are characteristic of proteins' secondary structure.	<u>alpha helices</u> or <u>alpha helix</u> [prompt on <u>helices</u> or <u>helix</u>]
2	Alpha helices [HEE-luh-sees] are common in proteins that span this cellular structure, which surrounds the cell and is composed of a lipid [LIP-id] bilayer.	cell <u>membrane</u> [or plasma <u>membrane</u>]
3	Alpha helices were discovered by this chemist, who is also known for proposing that people take megadoses of vitamin C.	Linus <u>Pauling</u>



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4th Section
Teamwork Questions

Question #25: Literature – U.S. Literature

10 points per part

This site was home to Tuttle's grocery, where French Pete and Kanaka [kuh-NAH-kuh] Joe shot each other.		
1	Name this location where a hotel was planned before the overflow of the North Fork River killed Thomas Luck.	The Luck of Roaring Camp
2	This author of "The Luck of Roaring Camp" wrote about the suicide of gambler John Oakhurst in "The Outcasts of Poker Flat."	(Francis) Bret Harte
3	In "The Luck of Roaring Camp", Oakhurst's "melancholy air and intellectual abstraction" drew a comparison to this Shakespearean character, the Prince of Denmark.	Hamlet

Question #26: Literature – U.S. Literature

10 points per part

This sailor was impressed into service on the HMS <i>Bellipotent</i> .		
1	Name this "foretopman" who refused a bribe of two guineas before accidentally killing John Claggart.	Billy Budd [accept either]
2	Billy Budd is the title character of a novel by this author, who wrote about Captain Ahab pursuing a whale in <i>Moby-Dick</i> .	Herman Melville
3	This four-word phrase was the last thing uttered by Billy Budd before he was hanged.	"God bless Captain Vere"



Question #27: Mathematics – Analytic Geometry

10 points per part

This way of describing a curve often uses the variable t to represent the progression of time.		
1	Name this system in which the variables that represent coordinates are expressed using a different variable. Often, x and y are expressed in terms of t .	<u>parametric</u> equations [accept <u>parameterization</u> ; prompt on <u>parameter</u>]
2	What curve is generated by the set of parametric equations x equals the tangent of t , and, y equals the secant of t ?	<u>hyperbola</u> [prompt on <u>conic</u> section]
3	Find the <i>area</i> of the shape generated by the parametric equations x equals 3 times the sine of t , and, y equals 4 times the cosine of t .	<u>12 pi</u>

Question #28: Mathematics – Analytic Geometry

10 points per part

This mathematical entity can be thought of as infinitely long, infinitely wide, and infinitely thin.		
1	Name this shape generated by equations of the form $Ax + By + Cz + D$ equals zero, where A , B , C , and D can be any number.	<u>plane</u>
2	For the equation above, the vector whose components are (A, B, C) is perpendicular to the plane, so it is given this name.	<u>normal</u> vector
3	Find the shortest distance from the origin to the plane $x + 2y + 2z$ equals 1.	<u>1/3</u>



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5th Section
Toss-up Questions

Question #29: Social Studies – World History

10 points

This leader outlawed the practice of splitting immovable property when its owner died in his Law of Single Inheritance. He initially shared power with his brother, Ivan V, and was succeeded by his daughter, Elizabeth I. He gained control of the Baltic via the Treaty of **Nystad** [**NYE-stad**], which was signed shortly after his victory at **Poltava** [**“pole”-TAH-vuh**] over Sweden in the Great Northern War. Among his policies was a tax for noblemen with beards. Name this Russian tsar who modernized the nation and built a new capital on the Gulf of Finland.

Peter the Great [accept **Peter I** or **Pyotr I** Alexeyevich Romanov; prompt on **Peter**]

Question #30: Science – Biology

10 points

A mutation in this protein can cause the blue **sclera** [**SKLAIR-uh**] characteristic of **osteogenesis** [**AHS-tee-oh-“genesis”**] imperfecta. This protein contains the unusual amino acid **hydroxyproline** [**“high”-DRAHK-see-PROH-leen**]. This protein, which requires vitamin C to synthesize, contains **glycines** [**GLY-seenz**] at roughly one in three residues, which allows it to form its triple helix structure. This protein forms a basket-weave shape when it forms scars. This protein is used to make gelatin. Name this most common protein in the human body, which makes up a large part of connective tissue.

collagen



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5th Section
Toss-up Questions

Question #31: Literature – British Literature

10 points

In this novel, Anne's revelation of a secret engagement led to the Steele sisters being thrown out of Barton Park. A sprained ankle in this novel leads to a brief affair with the father of Miss Williams' baby, John Willoughby. Upon learning of her fiancé's disinheritance, Lucy Steele opted to marry Robert Ferrars instead of Edward. Henry dies at the beginning of this novel, leaving it up to his son from his first wife to take care of his second wife and their daughters. Name this Jane Austen novel about Elinor and Marianne Dashwood.

Sense and Sensibility

Question #32: Mathematics – Math Concepts

10 points

An example of this solid named for Prince Rupert can pass through a smaller example of this solid. The difference between this solid and a **rhombohedron** [rahm-boh-HEE-dron] is that this solid has right angles. The **Delian** [DEE-lee-un] problem is to construct one of these shapes with exactly twice the volume of another one, which is impossible using a straightedge and compass. Also known as a regular **hexahedron** ["HEX"-uh-HEE-dron], this shape is one of the **Platonic** [pluh-TAH-nik] solids. Name this square prism with has six square faces.

cube [before "hexahedron", accept **regular hexahedron** and prompt on **hexahedron**; prompt on square **prism** before "prism"]



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Extra Section
Toss-up Questions

Extra Question #1: Social Studies – World History

10 points

In 1999, **Nairi Hunanyan** [NAY-ree hoo-NAN-yun] led an attack on this country's parliament that killed Parliament Speaker Karen **Demirchyan** [duh-MIRCH-yun] and Prime Minister Vazgen **Sargsyan** [sargs-YAN]. This country has a longstanding dispute over the region of Nagorno-Karabakh with **Azerbaijan** [az-ur-by-ZHAHN]. Its predominant ethnic group was targeted by Enver Pasha in a World War I genocide orchestrated by Turkey. Name this eastern European nation whose capital is Yerevan.

(Republic of) **Armenia** [or
Hayastani Hanrapetut'yun]

Extra Question #2: Fine Arts – Classical Music & Opera

10 points

This composer dedicated his first set of twelve **études** [ay-toods] to Franz **Liszt** ["least"] and his second set to Liszt's mistress Marie **d'Agoult** [dah-gool]. Though he did not nickname the individual pieces, they are often referred to by names such as *Waterfall*, *Ocean*, or *Revolutionary*. After John Field wrote the first nocturnes, this composer wrote 21 of them that are still widely performed. He also composed a large number of mazurkas and the "Tragic" and "Military" Polonaises. Name this pianist who spent the first half of his life in Poland and second half in Paris, the composer of the **Minute** [MIH-nit] Waltz.

Frédéric (François) Chopin
[fray-day-REEK shoh-PAN]
[or Fryderyk Franciszek
Szopen]



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Extra Question #3: Mathematics – Math Concepts

10 points

The organization TPTP maintains a list of thousands of problems for which this entity can be created by a computer. Herbert Robbins used a computer system called EQP to create one of these. Computers assisting with the creation of these things became controversial after one was created by Wolfgang Haken and Kenneth Appel for the four color theorem. Andrew Wiles wrote a famous example for **Fermat's [fair-mah'z]** Last Theorem. A basis step and an inductive step comprise ones of these that are done "by induction". Name these writings used to demonstrate the certainty of mathematical theorems, which in high school are often written in two columns.

mathematical **proof(s)**
[accept answers referring to **proving** mathematical statements]

Extra Question #4: Science – Earth Science

10 points

Two measurements of this condition are the Keetch-Byram index and the Palmer index. To monitor this condition, a center at the University of Nebraska releases a map each Thursday supported by the National Oceanic and Atmospheric Administration and the Department of Agriculture. This condition can lead to excessive dust storms. One measure of this condition uses wildfire risk, while another uses temperature and precipitation levels. Name this condition, recently a major problem in California, in which an area does not have enough water.

drought [prompt on descriptive answers that mention lack of rain or precipitation]



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Extra Question #5: Literature – British Literature

10 points

As part of his self-education, this character read **Plutarch's [PLOO-tark's]** *Lives of Illustrious Greeks and Romans*. During a trip to the Orkney Islands, he vowed to be with a man on his wedding night, during which this character killed Elizabeth Clerval. He used a locket to frame Justine Moritz for a murder. This character, who has yellow eyes and is eight feet tall, pursues its creator. Name this creation of a Swiss scientist named Victor in a novel by Mary Shelley.

Frankenstein's monster
[accept similar answers including both underlined parts; prompt on the **creature**; do not accept or prompt on "Frankenstein"]



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Extra Section
Teamwork Questions

Extra Question #6: Social Studies – U.S. History

10 points per part

Much of this person's local support waned after John Winthrop was elected governor.		
1	Name this supporter of antinomianism who, was formally excommunicated by the Boston Church before being encouraged by Roger Williams to start a colony in present-day Rhode Island.	Anne (<u>Marbury</u>) <u>Hutchinson</u> [accept either underlined name]
2	Convicted of slandering the ministers, Anne Hutchinson was banished from this colony, as were many unrepentant non-Puritans.	<u>Massachusetts Bay</u> Colony [prompt on <u>Massachusetts</u>]
3	The charter for the Massachusetts Bay Colony was granted by this king. Following the English Civil War, he was hanged outside Whitehall.	<u>Charles I</u> [prompt on <u>Charles</u>]

Extra Question #7: Social Studies – U.S. History

10 points per part

To alleviate the effects of this event, J. P. Morgan and the Rothschilds helped replenish the gold reserves of the U.S. Treasury.		
1	Name this financial collapse during the second term of Grover Cleveland.	<u>Panic of 1893</u>
2	One cause of the Panic of 1893 was this act that mandated additional purchases of the namesake precious metal on top of the requirements outlined in the Bland-Allison Act.	<u>Sherman Silver Purchase</u> Act [prompt on partial answer]
3	The Sherman Silver Purchase Act was passed alongside this protective tariff that raised the average rate to over 48%. Its namesake congressman became president after Cleveland's second term.	<u>McKinley</u> Tariff



Extra Question #8: Mathematics – Probability

10 points per part

To calculate binomial probabilities, this operation is used on a combination and the powers of two probabilities.		
1	Name this operation also performed on two independent probabilities to calculate the probability of both events occurring.	<u>multiplication</u> or <u>multiplying</u> or <u>product</u> [accept <u>times</u>]
2	If the probability of event <i>A</i> is one-fifth, and the probability of event <i>B</i> is ten-elevenths, and events <i>A</i> and <i>B</i> are independent, then what is the probability that both events will happen?	<u>2/11</u> [or <u>0.18 repeating</u>]
3	If a fair coin is flipped five times, what is the probability of getting exactly four heads?	<u>5/32</u> [or <u>0.15625</u>]

Extra Question #9: Mathematics – Probability

10 points per part

This method was used by John von Neumann [vawn NOY-mun] to make predictions on the ENIAC [EE-nee-aak] computer during the development of the hydrogen bomb.		
1	Name this type of statistical method that incorporates randomness and is named for a region in Europe.	<u>Monte Carlo</u> method [or <u>Monte Carlo experiment</u>]
2	If a Monte Carlo method was used to roll a pair of fair dice 36 times, what would be the expected number of times that a sum of 7 would come up?	<u>6</u> times
3	A roulette wheel has 18 red slots, 18 black slots, and 2 green slots. If a Monte Carlo method was used to spin the wheel 190 times, what would be the expected number of times the ball landed in a green slot?	<u>10</u> times