



**Question #1: Science – Biology**

*10 points*

<p>These cells border a region with pits that contains <b>foveolar</b> [foh-vee-OH-lur] cells. Because of the substance these cells release, they used to be known as <b>oxyntic</b> [“ox”-IN-tik] cells. People with antibodies against these cells have pernicious anemia. These cells release intrinsic factor that absorbs <b>cobalamin</b> [koh-BAL-uh-min]. These cells are stimulated by <b>histamines</b> [HISS-tuh-meenz] released by nearby <b>enterochromaffin-like</b> [en-TAIR-oh-KROH-muh-fin “like”] cells. These cells work in conjunction with chief cells, releasing a substance that turns their <b>pepsinogen</b> [pep-SIN-oh-jin] into pepsin. Name these stomach cells that release gastric acid, which contains hydrochloric acid.</p>	<p><b>parietal</b> cells [prompt on <b>gastric</b> cells or <b>delomorphous</b> cells; accept <b>oxyntic</b> cells before “oxyntic”]</p>
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**Question #2: Literature – British Literature**

*10 points*

<p>One poem by this writer is set in a “land of streams” where “it seemed always afternoon”. This author wrote of “music that brings sweet sleep down from the blissful skies” in a poem that concludes with the speaker telling his “brother mariners” to rest, for “we will not wander more”. This author of “The Lotus-Eaters” included the line “’tis better to have loved and lost than never to have loved at all” in a poem dedicated to Arthur Hallam, “In Memoriam.” Name this poet who wrote about six hundred people riding “into the valley of Death” in “The Charge of the Light Brigade”.</p>	<p>Alfred, Lord <b>Tennyson</b></p>
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**Question #3: Social Studies – U.S. History**

10 points

<p>In Chief Justice Taft’s decision in <i>Lum v. Rice</i>, he wrote that this other case was more difficult. This case was weakened by <i>Keys v. Carolina Coach Company</i>, which strengthened the Interstate Commerce Act. In his dissent to this decision, John Harlan wrote “The law regards man as man”, but Henry Brown’s decision was signed by the other seven justices. The incident leading to this case was staged by the New Orleans <b>Comité des Citoyens</b> [koh-mee-tay day-see-toy-en], which got a person then classified as an octoroon to board a whites-only train car. Name this 1896 case that was overturned by <i>Brown v. Board</i>, and which permitted “separate but equal” accommodations.</p>	<p><u><i>Plessy v. Ferguson</i></u> [accept either or both underlined parts; accept answers in either order]</p>
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**Question #4: Miscellaneous – Popular Culture**

10 points

<p>Marin is confused for this other character after rescuing a protagonist from the beach. In another appearance, this character is abducted once Onox and Veran are defeated. This character takes the name “Sheik” and teaches the protagonist a number of songs in another game. The Great Deku Tree referred to this character as the Princess of Destiny. This character holds the Triforce of Wisdom and is often captured by Ganondorf’s forces. Name this princess who is rescued by Link in a long-running Nintendo series.</p>	<p>Princess <u>Zelda</u></p>
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**Question #5: Science – Astronomy**

*10 points*

<p>The dynamical version of this effect is used on binary stars. A method named for this effect, but not actually based on it, is used on main sequence stars and is called the <b>spectroscopic</b> [spek-troh-SKAH-pik] form of it. This effect allows astronomers to convert a measurement in arcseconds into a measurement in parsecs, and is used to determine the distance of many objects by comparing observations of them at different times of the year. Name this effect in which stars or other objects appear to be in different locations when they are viewed from different angles.</p>	<p><u>parallax</u></p>
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**Question #6: Literature – Mythology**

*10 points*

<p>This person recommended the sacrifice of <b>Megareus</b> [muh-GAR-ay-us], but instead <b>Creon</b> [KREE-ahn] sent Megareus away from <b>Thebes</b> [theebz]. <b>Pentheus</b> [PEN-thee-uss] ignored this person's warning about the worship of <b>Dionysus</b> [die-uh-NIE-sus]. Hera punished this person following a seven-year curse, as he revealed that women derive more pleasure from sex than men. His words of wisdom led to <b>Jocasta</b> [yoh-KAHSS-tuh] taking her own life, and the king of Thebes blinding himself. Name this blind prophet who revealed that Oedipus married his own mother after killing his father.</p>	<p><u>Tiresias</u> [“tie”-REE-see-uss]</p>
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**Question #7: Science – Physics**

*10 points per part*

This term refers to opposite electric charges or magnetic poles separated by a distance.		
<b>1</b>	Give this term. Crossing this value with the field strength gives the torque that the field will cause on the object with this property.	(electric or magnetic) <b>dipole</b> moment
<b>2</b>	Since that torque is computed with the cross product, it is a vector whose direction can be found using this body part.	<b>right hand</b> [prompt on <b>hand</b> ; accept more specific answers]
<b>3</b>	The magnetic moment of an electron can be expressed in terms of this constant, equal to elementary charge times reduced Planck constant divided by twice the electron mass.	<b>Bohr magneton</b> [prompt on <b>magneton</b> ]

**Question #8: Science – Physics**

*10 points per part*

According to this equation, when a fluid speeds up, its pressure or potential energy decreases.		
<b>1</b>	Name this equation stating that half speed squared, plus the gravitational acceleration times the height of the fluid, plus pressure over density, is constant.	<b>Bernoulli's</b> [ <b>bur-NOO-lee'z</b> ] equation or <b>Bernoulli's</b> principle
<b>2</b>	Bernoulli's equation can be derived by integrating the momentum equation from this set of fluid equations which can be derived from the <b>Navier-Stokes</b> [ <b>nav-yay "stokes"</b> ] equations by assuming viscosity and conductivity are zero.	<b>Euler</b> [ <b>OY-lur</b> ] equations
<b>3</b>	The Euler and Navier-Stokes equations are this general type of equation, since they relate properties as well as rates of change of those properties.	(partial) <b>differential</b> equations [accept <b>ODEs</b> or <b>PDEs</b> ; prompt on answers containing <b>derivative</b> ]



**Question #9: Literature – World Literature**

10 points per part

This author’s “The Library of Babel” is in his collection <i>Ficciones</i> [feeek-see-“OWN-ace”], which also contains “The Garden of Forking Paths”.		
<b>1</b>	Name this writer of “The Aleph”, a story in which the entire universe can be seen from a single point in Carlos Daneri’s cellar.	Jorge Luis (Francisco Isidoro) <b>Borges</b> [HOR-hay loo-EES <b>BOR-hayss</b> ]
<b>2</b>	Jorge Luis Borges was from this South American country. Its national epic is the gaucho story “Martín Fierro”.	<b>Argentina</b> [or <b>Argentine Republic</b> or República <b>Argentina</b> ]
<b>3</b>	<i>Kiss of the Spider Woman</i> , by the Argentinian writer <b>Manuel Puig</b> [mah-noo-EL PWEEG], takes place in a room in this type of structure. The American author John Cheever’s <i>Falconer</i> is in the same type of setting.	<b>prison</b> [accept <b>jail</b> or <b>penitentiary</b> ]

**Question #10: Literature – World Literature**

10 points per part

This character tells <b>Philinte</b> [fee-lant], “Kindly leave me alone.”		
<b>1</b>	Name this character summoned by the Marshals of France over a series of insults. He rejects <b>Célimène</b> [seh-lee-men] in favor of <b>Eliante</b> [el-yahnt], who turns him down.	<b>Alceste</b> [al-sest] [prompt on The <b>Misanthrope</b> ]
<b>2</b>	Alceste vehemently disagrees with Philinte’s praise of <b>Oronte’s</b> [aw-rawnt’s] poetry in this writer’s <i>The Misanthrope</i> .	<b>Molière</b> [mohl-yair] [or Jean-Baptiste <b>Poquelin</b> ]
<b>3</b>	The poem Oronte recites to Philinte and Alceste is in this form. Other examples of this form of poetry include “O thou my lovely boy” and “When in disgrace with fortune”.	<b>sonnets</b> [accept more specific answers]



**Question #11: Social Studies – Psychology**

*10 points per part*

This person applied his ideas to education in the book <i>Freedom to Learn</i> .		
<b>1</b>	Name this American psychologist who developed the idea of person-centered therapy.	Carl (Ransom) <b><u>Rogers</u></b>
<b>2</b>	Rogers stressed that the therapist must have this quality, the ability to share another person’s feelings, emotions, and perspective.	<b><u>empathy</u></b> [or <b><u>empathic</u></b> understanding]
<b>3</b>	Rogers worked with this person to develop humanistic psychology. Rogers’ phrase “actualizing tendency” influenced this person to place self-actualization atop his hierarchy of needs.	Abraham (Harold) <b><u>Maslow</u></b>

**Question #12: Social Studies – Psychology**

*10 points per part*

The fundamental error named for this concept, also known as correspondence bias, is based on the strong weight that many people give to personal character over environment.		
<b>1</b>	Name this term that refers to how people explain causes or motivations of events.	<b><u>attribution</u></b> [accept word forms]
<b>2</b>	The ability to attribute impersonal qualities to humans was used by this Yale professor to explain his experiment in which some people gave what they thought were electric shocks to people they were supposedly teaching.	Stanley <b><u>Milgram</u></b>
<b>3</b>	The topic of attribution and the work of Stanley Milgram fall within this branch of psychology concerned with how a person acts in group situations.	<b><u>social</u></b> psychology [do not accept “sociology”]



**Question #13: Mathematics – Probability**

*10 points per part*

This mathematician posed a problem asking for the probability that a random chord in a circle was longer than the side of an equilateral triangle inscribed in that circle.		
<b>1</b>	Name this French mathematician. He also popularized a W.A. Whitworth problem asking whether a winning candidate in an election will be ahead throughout the vote counting.	Joseph (Louis François) <b><u>Bertrand</u></b>
<b>2</b>	Because Bertrand’s circle problem seems clearly defined but is not, it is often classified as this type of illogical statement.	<b><u>paradox</u></b> [or <b><u>antinomy</u></b> ]
<b>3</b>	If you choose one of the triangle vertices and then choose another point on the circle at random, find the probability that the chord connecting them is longer than the length of an inscribed equilateral triangle.	<b><u>1/3</u></b> or <b><u>0.3 repeating</u></b>

**Question #14: Mathematics – Probability**

*10 points per part*

This approximation involves the following formula: the square root of the quantity $2\pi n$ , end quantity, times $n^n$ over $e^n$ .		
<b>1</b>	Identify this approximation named for a Scottish man even though credit should go to Abraham <b>de Moivre</b> [duh mwahv].	<b><u>Stirling</u></b> ’s approximation (or <b><u>Stirling</u></b> ’s formula)
<b>2</b>	That formula approximates this function. It is symbolized by an exclamation point, and its outputs are the number of ways that a given number of objects can be arranged in a line.	<b><u>factorial</u></b> function
<b>3</b>	What is the value of 5 factorial?	<b><u>120</u></b>



**Question #15: Literature – U.S. Literature**

10 points

<p>The world, soul, skin, and nose are called holy in “A Footnote to” this poem. The narrator of this poem describes dreams of a sea-journey on the highway across America in tears, to the door of his cottage in the Western night. In this poem, “faculties of the skull no longer admit the worms of the senses” and “Twenty five thousand mad comrades all together singing the final stanzas of the Internationale” are both spotted in Rockland, where the speaker repeatedly indicates “I’m with you”. Name this poem whose speaker “saw the best minds of my generation destroyed by madness”, written by Alan Ginsberg.</p>	<p><u>“Howl”</u></p>
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**Question #16: Social Studies – Economics**

10 points

<p>Karl Marx wrote about the constant, variable, and fictitious forms of this concept. The balance of payments for a country is often broken down into the current account and the account of this concept. The combination of a company’s equity and debt comprises a “structure” named for this concept. <b>Thomas Piketty [toh-mah pee-keh-tee]</b> used the letter <i>r</i> to represent the after-tax rate of return on this quantity in his book named for this concept <i>in the 21st Century</i>. Identify this concept used to title a Karl Marx book that refers to goods used in production in order to earn a profit.</p>	<p><u>capital</u></p>
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**Question #17: Fine Arts – Art History**

10 points

One painting by this artist shows a woman reading a newspaper, with part of her right arm visible in a mirror on the left side. This painter of *Reading Le Figaro* made a work showing four pieces of furniture, one of which has a dog sleeping on it and another of which has a girl leaning back with her elbow up; that work is *Little Girl in a Blue Armchair*. This artist painted a work showing a woman in a striped robe soaking her child's feet in a round bowl. This painter was born in the United States but moved to France to live with the Impressionists. Name this person who often painted mothers, including the work *The Child's Bath*.

Mary (Stevenson) Cassatt

**Question #18: Science – Chemistry**

10 points

**Invertase** [in-VERT-"ace"] breaks down this molecule in plants, but animals use a different enzyme. Robert **Stämpfli** ["STOMP-flee"] developed a technique in which this molecule is used to create a "gap" to study nerve membrane activities. Because of how solutions of this molecule rotate polarized light, when this molecule is broken up the resulting syrup is called "invert". Much of the production of this molecule comes from growing *Beta vulgaris*, a type of beet. This common molecule has the same chemical formula as **lactose** ["LACK"-tohss] and **maltose** ["MALT"-ohss]. Name this **disaccharide** ["die-SACK-uh-ride"] with 12 carbon atoms per molecule that can be broken down into glucose and fructose.

sucrose [prompt on table  
sugar or disaccharide]



**Question #19: Social Studies – World History**

*10 points*

<p>At the end of this war, Rudolf von Colloredo was able to stop an attack against a city but could not protect a large castle. Earlier in this war, von Colloredo slowed down Prince Bernard in part by burning a city near a battle, adding to the already intense fog. Albrecht von <b>Wallenstein</b> [VAL-en-shteen] appeared to lose that battle, <b>Lützen</b> [LOOT-zen], though in the long term he gained from it. This war severely weakened the Habsburg Holy Roman Empire. Name this war in which Gustavus Adolphus died, and which ended with the Peace of Westphalia.</p>	<p><u>Thirty Years’ War</u></p>
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**Question #20: Mathematics – Math Concepts**

*10 points*

<p>In the context of matrices, this property is the real-number equivalent of being unitary. A matrix has this property if it, times its transpose, equals an identity matrix, which means that its transpose equals its inverse. The Gram-Schmidt process might normalize a set of vectors, and definitely turns them into a set of vectors with this property. Give this adjective that is a generalization of the term “perpendicular” for any vectors whose inner product is zero.</p>	<p><u>orthogonality</u> [accept pairwise <u>orthogonality</u>; prompt on <u>perpendicularity</u> or answers referring to <u>right angles</u> before “perpendicular”]</p>
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**Question #21: Literature – British Literature**

*10 points per part*

Aegeon [ee-JEE-un] was forced to pay a fine of 1,000 marks or be executed for the crime of being from this city.		
<b>1</b>	Name this city. One man from this place falls in love with Luciana [loo-CHAH-nah], whose sister Adriana was married to Luciana’s twin’s suitor.	<u>Syracuse</u>
<b>2</b>	That occurs in this Shakespearean comedy, in which much confusion arises from two twins, separated at birth, both being named Antipholus [an-TIFF-oh-luss].	A <u>Comedy of Errors</u>
<b>3</b>	The Antipholus twins were served by two men who were also twins and each had this first name.	<u>Dromio</u>

**Question #22: Literature – British Literature**

*10 points per part*

Dr. Branom describes this language as “odd bits of old rhyming slang”.		
<b>1</b>	Name this fictional, Russian-influenced language.	<u>Nadsat</u>
<b>2</b>	Nadsat is a teen slang language in this novel. Its main character, Alex, is drugged and forced to watch violent images, a method called the Ludovico technique.	A <u>Clockwork Orange</u>
<b>3</b>	In <i>A Clockwork Orange</i> , the Korova bar serves this substance, laced with a variety of drugs.	<u>milk</u> plus or <u>moloko</u> plus



**Question #23: Social Studies – World History**

10 points per part

This person’s code of law was written around 621 BCE, and prescribes death for many crimes.		
1	Name this Athenian lawmaker.	<u>Draco</u> (n)
2	This person described Draco’s constitution in his book <i>Constitution of Athens</i> . This philosopher started the <b>Lyceum</b> [“lie-SEE-um”] and was a student of Plato.	<u>Aristotle</u> [or <u>Aristoteles</u> ]
3	Draco supported the creation of a legislative Council of Four Hundred, and made this group the guardian of the laws.	Council of the <u>Areopagus</u> [“air”-ee-oh-PAY-guss]

**Question #24: Social Studies – World History**

10 points per part

Germany was split into two countries from the end of World War II until 1990.		
1	Reunification involved tearing down this structure starting in November 1989. This structure was built in 1961 to restrict travel between East and West Germany.	<u>Berlin Wall</u> [or <u>Berliner Mauer</u> ]
2	This man was the Chancellor of West Germany from 1982 to 1990, and then the chancellor of unified Germany until 1998.	Helmut (Josef Michael) <u>Kohl</u>
3	After reunification, Germany signed a treaty with Poland reaffirming this line as their border. This line is named for two rivers.	<u>Oder-Neisse</u> [OH-dur “niece”] line [or granica na <u>Odrze i Nysie</u> Luzyckiej or <u>Oder-Neise-Grenze</u> ]



**Question #25: Fine Arts – Classical Music & Opera**

*10 points per part*

One composer of this era, Frédéric <b>Chopin</b> [ <b>SHOW-pan</b> ], said “Sometimes I can only groan, and suffer, and pour out my despair at the piano.”		
<b>1</b>	Name this musical era that followed the Classical era and lasted through most of the 19th century.	<b>Romantic</b> era or <b>Romanticism</b> [or <b>Romanticist</b> ]
<b>2</b>	The Romantic era included “musical nationalism”. Chopin wrote pieces reflecting the fact that he was from this country even though he lived much of his life in France.	<b>Poland</b> [accept the Duchy of <b>Warsaw</b> or Księstwo <b>Warszawskie</b> or Duché de <b>Varsovie</b> ]
<b>3</b>	Some of the first Romantic operas were written by this composer of <i>Der Freischütz</i> [“dare <b>FRY-shirts</b> ”] and <i>Oberon</i> .	Carl Maria von <b>Weber</b> [ <b>VAY-bur</b> ]

**Question #26: Fine Arts – Classical Music & Opera**

*10 points per part*

This composer wrote a pantomime ballet about a woman who lures men up to a room to be robbed, <i>The Miraculous Mandarin</i> .		
<b>1</b>	Name this Hungarian composer who wrote the large collection of piano pieces <i>Mikrokosmos</i> [ <b>meeek-roh-KOHSS-mohss</b> ].	Béla (Viktor J’anos) <b>Bartók</b> [accept names in any order]
<b>2</b>	In this one-act Bartók opera, the bride Judith insists on opening each of the seven doors in her new residence.	(Duke) <b>Bluebeard’s Castle</b> [or <i>A kékszakállú herceg vára</i> ]
<b>3</b>	Bartók and this composer collaborated on a collection of Hungarian folk songs. On his own, this composer wrote the opera <i>Háry János</i> and the choral work <i>Psalmus Hungaricus</i> .	Zoltán <b>Kodály</b> [ <b>KOH-“die”</b> ] [accept names in either order]



**Question #27: Mathematics – Algebra**

*10 points per part*

This type of polynomial function can have at most four terms, at most two local extrema, and at most one point of inflection.		
<b>1</b>	Give this term for a polynomial whose degree is 3.	<u>cubic</u> polynomial or <u>cubic</u> function
<b>2</b>	Give all three zeroes of the cubic polynomial $x^3 - 100x$ [ <i>“x cubed minus 100 x”</i> ].	$x = \underline{-10}$ , $x = \underline{0}$ , and $x = \underline{10}$ [accept answers in any order; the $\underline{-10}$ and $\underline{10}$ may be combined as $\underline{\pm 10}$ ]
<b>3</b>	Give all three zeroes of the cubic polynomial $x^3 - 6x^2 - 4x + 24$ [ <i>“x cubed minus 6 x squared minus 4 x plus 24”</i> ].	$x = \underline{-2}$ , $x = \underline{2}$ , and $x = \underline{6}$ [accept answers in any order; the $\underline{-2}$ and $\underline{2}$ may be combined as $\underline{\pm 2}$ ]

**Question #28: Mathematics – Algebra**

*10 points per part*

This term is used for the number written in subscript in a logarithmic expression, and for a number that is raised to an exponent.		
<b>1</b>	Give this term that can also mean the role 10 takes in the decimal system.	<u>base</u>
<b>2</b>	In hexadecimal, or base 16, the letter ‘D’ means the same thing as this number in base 10.	<u>13</u>
<b>3</b>	Convert the decimal value 20 into the octal system, which is base 8.	<u>24</u> [should be pronounced <u>two four</u> , but accept <u>twenty-four</u> ]



**Question #29: Social Studies – U.S. History**

*10 points*

<p>This event started with protests at county courthouses by groups who — out of respect for previous actions in North Carolina — called themselves “Regulators”. Governor James <b>Bowdoin</b> [<b>BOH-din</b>] called up a force headed by Benjamin Lincoln that ended this event, though the lack of federal action frustrated Henry Knox. This attempt to get debt relief for farmers was led by a war veteran. This event demonstrated some of the weaknesses of the Articles of Confederation and influenced the Constitutional Convention. Name this armed uprising that attempted to take over an armory in Springfield, Massachusetts.</p>	<p><u>Shays</u>’(s) rebellion [accept similar words in place of “rebellion”; do not accept answers that contain “Shay” in place of “Shays”]</p>
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**Question #30: Mathematics – Math Concepts**

*10 points*

<p>In <math>k</math>-nearest-neighbor models, the choice of <math>k</math> is an example of the tradeoff between bias and this quantity. For a <b>chi</b> [<b>kie</b>]-squared distribution, this value is twice the mean. Ronald Fisher developed a method to break down this quantity into components and determine whether two means are equal. In the formula for a normal distribution, this quantity is multiplied by 2 in the denominator of the exponent, and this same quantity is also inside the square root with 2 pi in the denominator of the coefficient. This quantity equals the average value of the squared deviation from the mean. Name this measure of dispersion that equals the square of the standard deviation.</p>	<p><u>variance</u></p>
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**Question #31: Literature – World Literature**

10 points

One novel by this author has sections from the point of view of Rolf Carlé, who eventually leaves Europe and falls in love with a woman whose name means “life”. This described a character who gets pregnant via Tao Ch’ien but miscarries. That character’s granddaughter Aurora del Valle is the protagonist of *Portrait in Sepia*, which is the sequel of *Daughter of Fortune*. This author wrote a novel that begins and ends with “Barrabas came to us by the sea.” In that novel by this author, a character receives three human fingers in the mail, and there is a man who lives in “the big house on the corner”, named **Esteban Trueba** [ESS-tay-bahn troo-AY-bah]. Name this author of *Eva Luna* [AY-vah LOO-nah] and *The House of the Spirits*.

**Isabel Allende** (Llona)  
[EE-sah-bel  
“eye”-YEN-day]

**Question #32: Science – Physics**

10 points

The inverted type of this device is a classical control problem whose solution led to the development of Segways. The motion of the spherical type of this object is described with **Weierstrass** [VY-ur-shtrass] elliptic functions, while the motion of the planar type is described with **Jacobi** [YAH-koh-bee] elliptic functions. Parallel rods of different metals are used to make these objects less dependent on temperature. Under the small-angle approximation, the motion of these objects can be treated as simple harmonic motion. The rotation of the Earth was demonstrated by one of these objects designed by **Léon Foucault** [lay-aw foo-kohl]. Name these objects that swing back and forth.

**pendulums** [accept  
**pendula**; prompt on  
**bobs]**





**Extra Question #1: Literature – U.S. Literature**

10 points

During the first scene in this play, the family matriarch feels the dirt her plant is growing in and worries that the plant will not live until spring, and at the end of the play, the matriarch takes her plant as the family moves out of its apartment. During this play, a person claiming to be from “a sort of welcoming committee” offers to buy a house on behalf of the Clybourne Park Improvement Association. The sister of this play’s protagonist refuses to marry George Murchison, and was proposed to with an offer to practice medicine in Africa by Joseph Asagai [“ASS-uh-guy”]. Name this play about the Younger family, by Lorraine Hansberry.

A *Raisin in the Sun*

**Extra Question #2: Science – Biology**

10 points

Young organisms in this order can be differentiated from young sawflies by their cleavage lines. This order’s young organisms have prolegs [“pro-legs”] with crochets [KRAH-chits] that allow them to hook on to surfaces. Because females of this order have separate openings for mating and laying eggs, most of its species are classified as ditrysia [“die-TRY-see-uh”]. Older members of this order have scales on their wings that differentiate them from caddisflies [KAD-iss-“flies”]. Members of this order use a chrysalis [KRIS-uh-lis] or a cocoon while undergoing metamorphosis. Name this order whose members start out as caterpillars and become moths or butterflies.

Lepidoptera  
[lep-ih-DAHP-tur-uhnz]



### Extra Question #3: Mathematics – Math Concepts

10 points

<p>This person's textbook, whose name translates as <i>Analysis of the infinitely small to understand curves</i>, was written after works by Johann Bernoulli but was the first textbook to cover only <i>differential</i> calculus. That textbook contains what is now a rule named for this mathematician, which can be used to evaluate situations such as 0 raised to the 0 power, or infinity raised to the 0 power, when those expressions are interpreted as limits. Name this Frenchman whose rule states that you can differentiate the numerator and denominator of a limited expression that approaches 0 over 0, or infinity over infinity.</p>	<p>Guillaume de <b>L'Hôpital</b> ["low-pee-tall"] [or Guillaume de <b>L'Hospital</b>]</p>
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### Extra Question #4: Social Studies – World History

10 points

<p>Six members of this organization from five countries were shot in their sleep in Chechnya in 1996. The creation of this organization was inspired by the 1862 book <i>A Memory of Solferino</i>; the same book also inspired the creation of the First Geneva Convention, which officially recognized this organization. That book that inspired this organization was written by Henry Dunant, who shared the first Nobel Peace Prize. This organization won Nobel Peace Prizes during both world wars. Name this organization that helps wounded soldiers.</p>	<p>International Committee of the <b>Red Cross</b> [or <b>ICRC</b> or International Federation of <b>Red Cross and Red Crescent Societies</b> or <b>IFRC</b>]</p>
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**Extra Question #5: Fine Arts – Classical Music & Opera**

*10 points*

This instrument takes the lead role in Michael Daugherty’s *Dead Elvis*. Edward Elgar played violin and this instrument, and wrote a “romance” for it. Mozart’s first woodwind concerto was for this instrument. More recent performers on this instrument include Klaus Thunemann [klaus TOON-uh-mahn] and Milan Turković [mee-lahn TUR-koh-vich]. This instrument plays in an unusually high register in “The Adoration of the Earth,” which opens Igor Stravinsky’s *The Rite of Spring*. Name this instrument that, like the English horn and the oboe, uses a double reed.

bassoon



### Extra Question #6: Science – Chemistry

*10 points per part*

In a chemical reaction, this kind of reagent is contrasted with an excess reagent.		
<b>1</b>	Give this term for a reagent that, in theory, is completely consumed in a reaction.	<b>limiting</b> reagent or <b>limiting</b> reactant
<b>2</b>	This two-word phrase refers to the output of a reaction if the limiting reagent is, in fact, completely consumed.	<b>theoretical yield</b>
<b>3</b>	This quantity, used to solve for the limiting reagent, equals the quantity that combines with about 1 part of hydrogen or 8 parts of oxygen.	<b>equivalent</b> weight [accept gram <b>equivalent</b> ]

### Extra Question #7: Science – Chemistry

*10 points per part*

It is unusual for nuclei with odd numbers of both protons and neutrons to be stable.		
<b>1</b>	Name the only element whose most abundant isotope is stable and has an equal odd number of protons and neutrons. Carbon-14 decays into that isotope.	<b>nitrogen</b> (-14) [accept <b>N</b> ]
<b>2</b>	One of the isotopes with an odd number of both protons and neutrons of this element is not stable, but has a half-life slightly over a billion years. Some rocks are dated by comparing amounts of that isotope with argon with the same atomic mass.	<b>potassium</b> (-40) [accept <b>K</b> ]
<b>3</b>	The rarest naturally occurring isotope is a metastable state of this element that has never been observed to decay naturally. This element is always found with <b>niobium</b> [ny-OH-bee-um], and is used in capacitors.	<b>tantalum</b> <b>[TANT-uh-lum]</b> (-180) [accept <b>Ta</b> ]



**Extra Question #8: Social Studies – U.S. History**

*10 points per part*

Answer the following about the election of 2000.		
<b>1</b>	The winner of the popular vote, but loser of the electoral college, was this Democrat who had been the vice president under Bill Clinton.	Al(bert Arnold) <b><u>Gore</u></b> (Jr.)
<b>2</b>	A dispute over the election went to the Supreme Court. Name the state whose recount was stopped in the case <i>Bush v. Gore</i> .	<b><u>Florida</u></b>
<b>3</b>	Although both he and his father had represented this state in the Senate, Gore failed to carry it in the presidential election.	<b><u>Tennessee</u></b>

**Extra Question #9: Social Studies – U.S. History**

*10 points per part*

This president and major general was nicknamed “Old Rough and Ready”.		
<b>1</b>	Name this Mexican-American War hero who died, possibly from cholera [KAH-lur-uh], less than two years after being elected President.	Zachary <b><u>Taylor</u></b>
<b>2</b>	The Mexican-American War involved a dispute over which river should form the northern boundary of Mexico. Mexico wanted it to be the Nueces [noo-AY-sayss] River, but Taylor provoked them by setting up a fort on this river.	Río <b><u>Grande</u></b> [or Río <b><u>Bravo</u></b> del Norte]
<b>3</b>	Taylor defeated Santa Anna at this major battle following Taylor’s victory at Monterrey. This battle was also known as the Battle of Angostura.	Battle of <b><u>Buena Vista</u></b>