



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

*10 points*

<p>Late in this person’s presidency, he signed a bill giving loan guarantees to Chrysler to prevent its bankruptcy. After this person was president, he started negotiations on an agreed framework to limit North Korean nuclear weapons. As president, this person appointed Shirley Hufstedler as the first Secretary of Education and James Schlesinger as the first Secretary of Energy. This former governor of Georgia negotiated the return of the Panama Canal Zone to Panama. Name this president during the Iran Hostage Crisis, who failed to be re-elected when he lost to Ronald Reagan.</p>	<p>(James Earl) Jimmy <b>Carter</b> (Jr.)</p>
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**Question #2: Miscellaneous – Technology**

*10 points*

<p>Chrome OS is built on this operating system. It is an alternative to System V [“five”] and BSD, and is a component of the LAMP bundle. This operating system, developed at the University of Helsinki, often uses GNOME for its graphics, and is available in “distributions” like Gentoo, Debian, and <b>Ubuntu</b> [uh-BUN-too]. It is derived from the <b>GNU</b> [G-N-U] project. Name this open-source operating system that was created by Linus Torvalds, a variant of <b>Unix</b> [YOO-niks].</p>	<p><b>Linux</b> [LIN-iks] [prompt on <b>Unix</b> before “System V”]</p>
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### Question #3: Science – Chemistry

*10 points*

An isotope of this element is the most common target for neutron capture therapy. Clusters of this element are held together by electron-deficient three center-two electron bonds. Those clusters can have **closo** [“CLOSE-oh”], **nido** [“NIGH”-doh], or **arachno** [“uh-RACK-no”] structures predicted by Wade’s rules. This element is used in the first step of an anti-**Markovnikov** [mar-KOV-nee-kof] addition of an alcohol. This element’s trifluoride is a common example of a Lewis acid, and violates the octet rule by having only 6 electrons. This element is included in the silicate used to make Pyrex glass. Name this element whose atomic number is 5 and whose symbol is B.

**boron** [prompt on **B** before the end]

### Question #4: Social Studies – Religion

*10 points*

One tradition claims this man fathered Shehid bin Jer, from whom the Yazidi are descended. In First Corinthians, he is called both a “living soul” and a “life-giving spirit”. In Islam, Raziel gave the Tzohar to this man, before whom all prostrated except Iblees. In Jewish folklore, his first wife Lilith refused to submit to him. He lived for 930 years, fathering Seth at the age of 130. Soon after this man named all the living creatures, one of his ribs was taken away. Name this father of Cain and Abel who was expelled from the Garden of Eden along with his wife Eve.

**Adam** [may be pronounced ah-DAHM]



### Question #5: Science – Health

10 points

<p>This substance secreted by some <i>Bacillus</i> [<i>buh-SIL-lus</i>] bacteria is added to corn starch and water in the production of corn syrup. The strength of a sample of this substance is measured in dextrinizing units. <b>Pleural</b> [“plural”] tests for this substance and blood tests for both <b>lipase</b> [“LIE-pace”] and this substance are used to detect <b>pancreatitis</b> [“pain”-kree-uh-“TIE”-tiss]. Medicines that inhibit this enzyme, which are used for type 2 diabetes and are a controversial weight loss drug, are also called starch blockers. It is secreted by the serous gland. Name this enzyme that converts starch into sugar, found in saliva.</p>	<p><b>amylase</b> [accept <b>alpha-amylase</b>; prompt on <b>enzymes</b>]</p>
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### Question #6: Literature – Grammar/Usage

10 points

<p>George Kennedy developed the Yale system for transliterating this language. Ancient calligraphy in this language utilized seal, cursive, and clerical scripts. This is the most-spoken language to use CJK characters, in which context they are called <i>hanzi</i> and are collected in the <i>Hanyu Da Zidian</i> [<i>HAHN-yoo dah ZI-dee-un</i>]. It is usually romanized using the Wade-Giles or Pinyin system. Name this most-spoken language in the world, whose dialects include Cantonese and Mandarin.</p>	<p><b>Chinese</b> language [accept <b>Cantonese</b> or <b>Mandarin</b> before “Cantonese”]</p>
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**Question #7: Mathematics – Algebra**

*10 points per part*

This mathematician’s impossibility theorem completed work by Paolo <b>Ruffini</b> [roo-FEE-nee].		
<b>1</b>	Name this Danish mathematician who independently of <b>Galois</b> [gal-wah] determined which degrees of polynomials could not be solved <b>formulaically</b> [for-myu-LAY-ik-lee].	Niels (Henrik) <b>Abel</b> [AH-bul]
<b>2</b>	According to the <b>Abel</b> [AH-bel] impossibility theorem, this is the highest-degree polynomial whose roots can always be found with a standard formula.	<b>fourth</b> -degree polynomial or degree <b>four</b> or <b>quartic</b> polynomial/function/equation
<b>3</b>	Find all real zeroes for the quartic trinomial $x$ to the fourth minus six $x$ to the third plus eight $x$ squared. Give the three answers in any order.	$x = \mathbf{0}$ , $x = \mathbf{2}$ , and $x = \mathbf{4}$ [any order; “or” may be substituted for “and”]

**Question #8: Mathematics – Algebra**

*10 points per part*

This name of certain functions is based on the appearance of their graphs, which have several horizontal parts.		
<b>1</b>	Name these functions, one example of which is the floor function, which always rounds down, and another of which is the ceiling function, which always rounds up.	<b>step</b> functions [or <b>staircase</b> functions]
<b>2</b>	This English mathematician is the namesake of a step function that equals one for all positive inputs, equals zero for all negative inputs, and equals one-half if the input is zero.	Oliver <b>Heaviside</b>
<b>3</b>	What is the result of applying the floor function, or rounding down function, to an input of $-10/3$ [“negative ten over three”]?	<b>-4</b>



**Question #9: Fine Arts – Jazz**

*10 points per part*

This person's performances increased the prominence of the tenor saxophone in jazz music.		
<b>1</b>	Name this musician who transformed the song "Body and Soul" with his 1939 recording. His song "Blues for Yolande [yoh-LAHN-day]" appears on the album on which he encounters Ben Webster.	Coleman "Hawk" <b>Hawkins</b> [prompt on <b>Hawk</b> ]
<b>2</b>	Hawkins played on the song "Manteca" for this trumpeter, known for his big cheeks and bent instrument.	"Dizzy" <b>Gillespie</b> [or John Birks <b>Gillespie</b> ]
<b>3</b>	This tenor saxophonist recorded "The Girl from Ipanema [IP-uh-NEE-muh]" with singer Astrud Gilberto.	Stan(ley) <b>Getz</b>

**Question #10: Fine Arts – Jazz**

*10 points per part*

This musician composed the album <i>Free Jazz: A Collective Improvisation</i> , which featured a quartet in each of its two channels.		
<b>1</b>	Name this alto saxophonist who passed away in 2015.	Ornette <b>Coleman</b>
<b>2</b>	The songs "Lonely Woman", "Congeniality", and "Focus on Sanity" are on this Coleman album released in 1959, the year before <i>Free Jazz</i> .	<i>The <b>Shape of Jazz to Come</b></i>
<b>3</b>	This earlier alto saxophonist recorded "Yardbird Suite" and "Ornithology".	Charlie "Bird" <b>Parker</b>



**Question #11: Social Studies – World History**

*10 points per part*

This person died of a heart attack in 2006 before the end of his trial at The <b>Hague</b> [rhymes with “vague”] for crimes against humanity.		
<b>1</b>	Name this former president of the Federal Republic of Yugoslavia, who was accused of ordering an ethnic cleansing of Albanians in Kosovo.	Slobodan <b>Milošević</b> [mee-LAW-sheh-vich, but be lenient]
<b>2</b>	Milošević’s actions as president of this Socialist Republic included invasions of Croatia and Bosnia. In 2006, Montenegro became an independent nation after breaking off from this country.	(Republic of) <b>Serbia</b> (or Republika <b>Srbija</b> )
<b>3</b>	The Bosnian War was ended by a peace agreement signed in this U.S. city.	<b>Dayton</b> , Ohio

**Question #12: Social Studies – World History**

*10 points per part*

Described in detail in the <b>Mozarabic</b> [moze-uh-RAB-ik] Chronicle, this skirmish was prompted by a request by Odo the Great.		
<b>1</b>	Name this battle which ended the life of Muslim leader Abdul Rahman. Some historians also view it as ending the expansion of the <b>Umayyad</b> [OO-my-yad] caliphate.	Battle of <b>Tours</b> [toor] [or Battle of <b>Poitiers</b> [pwaht-yay]]
<b>2</b>	This father of Pepin the Short organized his infantry into a square at the Battle of Tours.	Charles <b>Martel</b> [accept Carolus <b>Martellus</b> or <b>Karl Martell</b> ; prompt on The <b>Hammer</b> ]
<b>3</b>	Charles Martel’s only defeat came against Radbod at this location, the home of his stepmother Plectrude. After the Neustrians took over this town, Martel rallied and avenged his loss.	<b>Cologne</b> [or <b>Köln</b> ]



### Question #13: Science – Chemistry

10 points per part

Substances with this property can be studied with <b>EPR [E-P-R]</b> spectroscopy.		
<b>1</b>	Name this property of materials that are attracted by external magnetic fields but do not retain magnetization.	<b>paramagnetism</b> or <b>paramagnetic</b> materials
<b>2</b>	Paramagnetism often occurs in these compounds with unpaired electrons.	free <b>radicals</b>
<b>3</b>	Paramagnetic materials like gadolinium can be used as contrast agents in this technique, reducing the amount of time needed for a scan while sacrificing little resolution.	<b>nMRI</b> [or nuclear <b>magnetic resonance imaging</b> ; do not accept “NMR (spectroscopy)”]

### Question #14: Science – Chemistry

10 points per part

In late 2015, German scientists used the Wendelstein 7-X to put helium into this phase of matter.		
<b>1</b>	Name this phase of matter that can be formed by induction in a technique called ICP.	<b>plasma</b>
<b>2</b>	The plasma in an ICP is typically this noble gas instead of helium. This is the third most common gas in the atmosphere.	<b>argon</b> [accept <b>Ar</b> ]
<b>3</b>	Argon plasma is used medically in the gastrointestinal tract to aid with this process, also known as blood clotting.	blood <b>coagulation</b> [or <b>coagulating</b> ]



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

10 points

<p>This person wrote about billionaire businessman Mickey Ross in the two-character play <i>China Doll</i>. His characters Deborah Soloman and Joan Webber often complain about men in general and Dan Shapiro and Bernie Litko specifically in <i>Sexual Perversity in Chicago</i>. In another of this writer's plays, Donny Dubrow tries to steal back a coin. This playwright also wrote about Richard Roma's attempts to become the top closer at an unethical real estate firm. Name this author of <i>American Buffalo</i> and <i>Glengarry Glen Ross</i>.</p>	<p>David (Alan) <b>Mamet</b></p>
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**Question #16: Social Studies – U.S. Government**

10 points

<p>When the Supreme Court used the third article of the Constitution to establish jurisdiction in Dred Scott, Roger <b>Taney's</b> [TAW-nee'z] decision extended the interpretation of this other article's Property Clause. The last part of this article protects states from invasion and from domestic violence after guaranteeing a republican form of government in each state. This article contains the Fugitive Slave and Extradition Clauses, and it also describes how new states can be admitted. Name this article of the U.S. Constitution describing relationships between states, which immediately follows the articles describing the branches of government.</p>	<p>Article <b>Four</b> [or <b>fourth</b> article]</p>
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### Question #17: Mathematics – Math Concepts

10 points

This statistical measure is often replaced by a similar measure when the variance is not known or the sample size is small. While that other measure has a mean of 50 and a standard deviation of 10, this measure has a mean of 0 and a standard deviation of 1. One definition of an outlier is that it is a data point for which the absolute value of this quantity is above 2 or above 3. This value is an alternative to the *t*-score. Name this value that describes how many standard deviations away from the mean a data point is.

**z-score** [accept **z-value** or **normal score** or **standard score**; prompt on **z** or **sigma**]

### Question #18: Literature – Mythology

10 points

During a Sardinian invasion, this figure exposed himself to fire and then embraced the attackers. Plato wrote that this figure carried a brass tablet of laws during his triennial journeys. Depending on the source, this creature was either a gift from **Hephaestus** [huh-FESS-tuss] to **Minos** [MY-nohss] or from Zeus to Europa. After he refused to let the Argonauts land, **Medea** [meh-DEE-uh] forced out the pin holding his blood, killing him. He hurled large rocks at ships that approached the shore. Name this bronze man of Greek myth who circled Crete three times each day.

**Talos**



**Question #19: Science – Physics**

10 points

A pair of substances that tend to exhibit this phenomenon are mixed when using a dilution refrigerator. Heat transfer can occur in a wave-like motion in substances exhibiting this phenomenon. One substance that demonstrates this phenomenon will undergo **Pomeranchuk [poh-mur-AN-chook]** cooling in place of solidification. The transition to this phenomenon occurs below the lambda point. Substances exhibiting this phenomenon can form a Rollin film and creep up the walls of their containers. This phenomenon is most well documented in helium-4 at very cold temperatures. Name this phenomenon in which a gas or liquid behaves as if its viscosity were zero.

**superfluidity** [accept word forms]

**Question #20: Fine Arts – Art History**

10 points

One painting by this artist shows his head and the heads of his assistants facing different directions above three animal heads facing corresponding directions. This painter of *Allegory of Prudence* showed Diana in two paintings that have a stream seemingly connecting them: one painting shows Diana learning that Callisto is pregnant, and the other shows Diana meeting **Actaeon [“ACT”-ay-ahn]**. This painter also showed a naked woman holding a posy of roses while her head and arm are propped on pillows while two other women are in the background by a chest. Name this 16th century Italian who painted *Venus of Urbino*.

**Titian [TEE-shun]** [or Tiziano **Vecelli** or Tiziano **Vecellio**]



**Question #21: Mathematics – Analytic Geometry**

*10 points per part*

This class of surfaces consists of sets of solutions to second-degree polynomials in the variables $x$ , $y$ , and $z$ .		
<b>1</b>	Name these surfaces such as ellipsoids, paraboloids, and hyperboloids.	<b>quadric</b> surfaces [accept <b>quadratic</b> surfaces]
<b>2</b>	Find the vertex of the paraboloid defined by the equation $z$ equals $x$ squared plus six $x$ plus $y$ squared. Give your answer as an ordered triple.	<b>(-3, 0, -9)</b> [order matters; accept answers such as <b><math>x = -3, y = 0, z = -9</math></b> ]
<b>3</b>	Find the shortest distance between the origin and the hyperboloid given by the equation $x$ squared divided by 9, minus $y$ squared divided by 16, minus $z$ squared divided by 25, equals 1.	<b>3</b>

**Question #22: Mathematics – Analytic Geometry**

*10 points per part*

This vector operation can only be defined usefully in three or seven dimensions.		
<b>1</b>	Name this type of vector multiplication that can be used to find the curl of a vector field, or to find the area of a parallelogram.	<b>cross product</b> [accept <b>crossing</b> ; accept <b>directed area product</b> ; prompt on vector <b>product</b> ]
<b>2</b>	If vector $P$ has the components 1, 0, 0, and vector $Q$ has the components 2, 3, 4, evaluate $P$ cross $Q$ .	<b>(0, -4, 3)</b> [order matters, accept answers such as <b><math>0i-4j+3k</math></b> or <b><math>x = 0, y = -4, z = 3</math></b> ]
<b>3</b>	Find the curl of the vector field defined by the components $y, 3, 5$ .	<b>(0, 0, -1)</b> [order matters, accept answers such as <b><math>0i+0j-1k</math></b> or <b><math>x = 0, y = 0, z = -1</math></b> ]



**Question #23: Literature – U.S. Literature**

*10 points per part*

In this first novel of the <i>Epic of Wheat</i> trilogy, Annixter convinces Magnus Derrick to take on moneyed interests on behalf of ranchers.		
<b>1</b>	Name this Frank Norris novel in which S. Behrman attempts to buy and seize land to expand a monopoly.	<i>The <u>Octopus</u></i>
<b>2</b>	S. Behrman’s efforts were on behalf of one of these companies. Anna Karenina committed suicide using a vehicle operated by this kind of company.	<b><u>rail</u></b> road companies or <b><u>rail</u></b> roads [prompt on answers referring to <b><u>transportation</u></b> or <b><u>shipping</u></b> ]
<b>3</b>	<i>The Octopus</i> is subtitled “A Story of” this state, the setting for <i>Tortilla Flat</i> .	<b><u>California</u></b>

**Question #24: Literature – U.S. Literature**

*10 points per part*

This poem is addressed “To him who in the love of Nature holds communion with her visible forms”.		
<b>1</b>	Name this poem whose speaker describes one’s final thoughts as a spiritual blight, and claims that Nature can have “a voice of gladness, and a smile, and eloquence of beauty”.	<b><u>“Thanatopsis”</u></b>
<b>2</b>	“Thanatopsis” was written by this American at the age of 17. He also wrote “To a Waterfowl”.	William Cullen <b><u>Bryant</u></b>
<b>3</b>	Carol Kennicott is a member of the “Thanatopsis Club” in the novel <i>Main Street</i> by this author.	(Harry) Sinclair <b><u>Lewis</u></b>



### Question #25: Science – Biology

10 points per part

This set of nine proteins is involved in the humoral defense.		
1	Name this set of proteins of the innate immune system, named for the fact that they help <b>phagocytic</b> [fay-goh-“SITE”-ik] cells and antibodies.	<b>complement</b> system
2	The proteins of the complement system form the membrane attack complex, which induces death in cells through this manner. This process involves the rupture of the membrane.	<b>lysis</b> [“LIE-sis”] or <b>lysing</b> [“LICE-ing”]
3	C5a of the complement system helps cause this immune response, which makes an area red and swollen.	<b>inflammation</b> [accept word forms]

### Question #26: Science – Biology

10 points per part

This <b>catecholamine</b> [kat-uh-KOH-luh-meen] is released from a namesake gland on top of the kidneys.		
1	Name this hormone, also found in an EpiPen. It is responsible for the fight-or-flight response.	<b>adrenaline</b> or <b>epinephrine</b>
2	The center of an epinephrine molecule is <b>chiral</b> [KIE-ru]. Epinephrine treatments to improve breathing work best when they are this type of mixture with equal amounts of both <b>enantiomers</b> [en-ANT-ee-oh-murz].	<b>racemic</b> [ray-SEE-mik] mixtures
3	Adrenaline is released from these cells within the adrenal medulla.	<b>chromaffin</b> cells



**Question #27: Social Studies – Economics**

10 points per part

By definition, these factors are not accounted for in calculating price within a given market.		
1	Name this factor accounted for on the marginal social cost curve. It is a consequence of economic activity that affects people who are not buying, selling, or producing.	<b>externality</b> [or <b>externalities</b> or <b>external costs</b> ; accept more specific answers that include an underlined term]
2	This author of <i>The Economics of Welfare</i> is the namesake of a tax designed to account for negative externalities.	Arthur (Cecil) <b>Pigou</b> [“pig-oh”] [prompt on <b>Pigovian</b> taxes]
3	Pollution, a classic example of an externality, can be addressed by this type of system, in which the government limits the total amount of pollution and companies buy and sell the right to pollute.	<b>cap and trade</b> [accept word forms like <b>capping and trading</b> ; accept <b>emissions trading</b> ]

**Question #28: Social Studies – Economics**

10 points per part

Adam Smith wrote that this value for land was determined by how it was used.		
1	Name this concept defined by Henry George as income gained by ownership, especially the ownership of land.	<b>rent</b>
2	This English economist described rent as a “differential surplus.” In <i>Principles of Political Economy and Taxation</i> , he expounded on his theory of comparative advantage.	David <b>Ricardo</b>
3	Ricardo argued against the use of paper currency in <i>The High Price of this</i> . This catchall term describes bars or ingots of precious metals, such as gold and silver.	<b>bullion</b>



**Question #29: Mathematics – Math Concepts**

10 points

In Pappus's Hexagon Theorem, this relationship arises when three points on one line are connected to three points on another line. **Menelaus's [men-uh-LAY-us'z]** theorem can be used to determine whether this relationship exists between points. When several points in a plane are transformed using a nonzero matrix with a zero determinant, the points take on this relationship. Three points with this relationship *cannot* be used to define a plane, and any two points must have this relationship. Give this term for points that are along the same line.

**collinearity** [prompt on descriptive answers mentioning points on the **same line**]

**Question #30: Literature – British Literature**

10 points

In this play, a man looking to learn to quarrel relies on insults such as “you are a pimp”, and two Anabaptists travel from Amsterdam to do business with the title character. During this play, a fake explosion is used to get Epicure Mammon to leave. This work's action begins with the departure of Lovewit on account of the plague, which allows Jeremy the Butler to assume the guise of Face. Name this Ben Jonson play in which Subtle pretends to be a person who can turn anything into gold.

*The Alchemist*



### Question #31: Social Studies – World History

10 points

<p>This person was the main assistant of <b>Fridtjof [FREED-yawf]</b> Nansen during a Russian famine and in providing relief to Armenian refugees. With <b>Johan Hjort [YOH-han h'YORT]</b>, he co-founded his country's National Unity party. He ruled his country jointly with <b>Josef [YOH-sef]</b> Terboven and was given the title "Minister President." He was eventually convicted for the murder of <b>Gunnar Eilifsen [GOON-ur "EYE"-lif-sen]</b> and killed by firing squad in front of the <b>Akershus [UH-kuss-HOOS]</b> Fortress. This person attempted to gain power by taking over the national radio station, but King <b>Haakon VII [ha-KOHN "the seventh"]</b> refused to recognize him. Name this World War Two Norwegian traitor.</p>	<p>Vidkun (Abraham Lauritz Jonsson) <b>Quisling</b></p>
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### Question #32: Science – Biology

10 points

<p>The SCF complex and the anaphase-promoting complex both perform the addition of this molecule, which is commonly added to targets with <b>KEN [ken]</b> boxes and destruction boxes. This molecule is added to targets at <b>lysine ["LIE-seen"]</b> residues, and it forms chains by being added to its own lysine residues. The addition of this protein occurs by forming <b>thioester ["THIGH"-oh-ess-tur]</b> linkages to a set of three enzymes labelled E1, E2, and E3. The formation of a chain of this 76-amino-acid polypeptide sends targets to the <b>proteasome [PROH-tee-uh-sohm]</b>. Name this small protein which is added to proteins to mark them for degradation, which is named due to it being found in nearly every tissue.</p>	<p><b>ubiquitin</b> [yoo-BIH-"quit-in"] [do not accept "ubiquinol"]</p>
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### Extra Question #1: Fine Arts – Classical Music & Opera

10 points

This composer's Octet in E-flat major, written when he was 16, is still performed. Much later, this composer worked with Ferdinand David, the premier soloist, on Violin Concerto in E Minor. One of his symphonies ends with a Saltarello that shifts to A minor; that piece, written soon after his *Fingal's Cave*, or *Hebrides* [*HEH-bri-dees*] Overture, is the Italian Symphony. This composer also wrote an overture and incidental music for Shakespeare's *A Midsummer Night's Dream*. Name this composer whose "Wedding March" is often performed with Wagner's [*VAHG-ner's*] "Bridal Chorus".

Felix Mendelssohn [or  
Jakob Ludwig Felix  
Mendelssohn Bartholdy]

### Extra Question #2: Social Studies – World History

10 points

The Fourteen Families oversaw the growth of the coffee crop in this country, where the violent gang MS-13 was founded. Archbishop Óscar Romero was assassinated in 1980 while leading a Mass in this country. One of its presidents, Tomás Regalado, died while trying to invade Guatemala. This country's invasion of a neighbor kicked off a "100-Hour War" that was ended with the help of the OAS. Among the catalysts of that war was an antagonistic policy towards immigrants from this country, as well as a tense series of soccer games against Honduras. Name this Central American country whose capital is San Salvador.

(Republic of) El Salvador  
[or República de El  
Salvador]



### Extra Question #3: Science – Earth Science

10 points

In soil, this quantity is tested by measuring electrical conductivity, specific gravity, TSS, and SAR. This soil quantity can become problematic if there is irrigation and a lot of evaporation without enough leaching. In water, this quantity is often measured in parts per thousand. This quantity is low in water called **oligohaline [OH-lih-goh-HAY-leen]**; a value around 10 or 20 causes water to be classified as brackish. This quantity is lowered by reverse osmosis, allowing the water to become more like groundwater or river water so people can drink it. Name this measurement of the concentration of salt.

**salinity** [accept word forms; accept answers mentioning **salt** before “concentration”]

### Extra Question #4: Literature – British Literature

10 points

In this novel, Dr. Kemp’s gun was used to shoot a cop. The protagonist of this novel then goes on a “Reign of Terror”, killing Mr. Wicksteed, who was the steward of Lord Burdock. The protagonist in this tale was accused of performing vivisection on a cat, and he burned down the boarding house to hide the evidence. Thomas Marvel takes the money and notebooks from this work’s protagonist. The title condition of this story is achieved by the protagonist by altering his body’s refractive index. Name this H. G. Wells novel in which Griffin is able to sneak around undetected.

*The **Invisible Man***



**Extra Question #5: Mathematics – Math Concepts**

*10 points*

The delay type of this entity is used when a variable is affected by previous values. If none of this entity's terms contain just the independent variable or a constant, then it is classified as homogeneous. One side of one example of these entities is a function times the quantity one minus the same function, and can be used to define the logistic function. Perhaps the simplest example of these things is solved by a constant times the exponential function. They are similar in nature to difference equations, and some can be solved by separation of variables. Name these equations that relate a function and its derivatives.

(ordinary) **differential**  
equations [or **ODEs**]



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

*10 points per part*

The Supreme Court case <i>Luther v Borden</i> concerned the arrest of one participant in this uprising.		
<b>1</b>	Name this rebellion that was ended by the drafting of a new constitution in Newport, Rhode Island. Its leader was unofficially elected as governor alongside Samuel Ward King.	<b><u>Dorr's</u></b> Rebellion
<b>2</b>	This president, who replaced William Henry Harrison, refused to directly intervene in Dorr's Rebellion.	John <b><u>Tyler</u></b>
<b>3</b>	The ultimate goal of Dorr's rebellion was to increase the number of men who had this right.	right to <b><u>vote</u></b> [or <b><u>suffrage</u></b> or political <b><u>franchise</u></b> ; accept word forms]

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

*10 points per part*

This massacre wiped out the members of the People's Temple, including its founder.		
<b>1</b>	Name this event in Guyana during which 900 people committed suicide, with the children forced to drink Flavor Aid laced with potassium cyanide.	<b><u>Jonestown</u></b> massacre
<b>2</b>	The Jonestown massacre was likely prompted by the murder of this Congressman in Port Kaituma following a visit to Jonestown.	Leo (Joseph) <b><u>Ryan</u></b> (Jr.)
<b>3</b>	The Jonestown massacre was the largest deliberate death of American citizens until the 9/11 attacks during this year.	<b><u>2001</u></b> [prompt on <b><u>'01</u></b> ]



**Extra Question #8: Mathematics – Probability**

10 points per part

This name applies to several situations, one of which involves two people making bets until one person runs out of money.		
1	Name this problem in which a person with a finite amount of money bets against an institution with an infinite amount of money.	<b><u>gambler’s ruin</u></b>
2	Gambler’s ruin is sometimes contrasted with this mistaken belief that if a random situation has not happened recently, then it is more likely to happen soon.	<b><u>gambler’s fallacy</u></b>
3	If the first card drawn from a randomly shuffled deck is an ace, and it is not replaced, then what is the probability that the second card is also an ace? Give your answer as a reduced fraction.	<b><u>1/17</u></b>

**Extra Question #9: Mathematics – Probability**

10 points per part

This person became president of the Royal Society in 1684, and he wrote a letter that became a well-known probability problem.		
1	Name this person most famous for his diary, which describes life in London before and after the Great Fire.	Samuel <b>Pepys</b> [“peeps”]
2	Pepys described the problem in a letter to this man, the author of <i>Principia Mathematica</i> [prin-KIP-ee-uh “math”-uh-MAT-ih-kuh].	(Sir) Isaac <b>Newton</b>
3	One of the problems was to find the probability of getting at least one six when a fair die is rolled six times. The problem is solved by subtracting this number raised to the sixth power from one.	<b><u>5/6</u></b> [or <b><u>0.83 repeating</u></b> ]