

## **2016 OAC States – Round 2**

Questions written by Ike Jose and Steven Wellstead

### **Category Round**

**American Literature: Answer the following about cars in literature.**

Team A: This Sinclair Lewis novel is named after Samuel, a seller of cars who tours Europe with his wife, Fran.

ANSWER: **Dodsworth**

Team B: A dude named Dude runs over his grandmother with a newly purchased car in this novel by Erskine Caldwell.

ANSWER: **Tobacco Road**

Tossup: This author suggested that when he spoke “ill of Swedish engineering,” he “diddled [himself] out of a Nobel Prize” in a humorous piece entitled “Have I Got a Car For You.” This author wrote about visiting heaven to meet Adolf Hitler and William Shakespeare in a work entitled *God Bless You, Dr. Kevorkian*. The protagonist of one novel by this author marries Valencia Merble but later has a child with Montana Wildhack, who is an adult film actress. The Bokkonon religion is introduced in another novel by this author, who created many works that feature the fictional sci-fi writer Kilgore Trout. Billy Pilgrim becomes “unstuck in time” in a novel by what writer who authored *Cat’s Cradle* and *Slaughterhouse-Five*?

ANSWER: Kurt **Vonnegut** Jr.

**Mathematics: Pencil and paper ready. Consider a 3 by 3 matrix denoted by the letter capital A that has the following entries: From left to right, its first row reads 4, 5, 6. Its second row reads 7, 8, 9. Its third row reads 10, 11, 12. You will have 45 seconds for the team questions.**

Team B: Give the entry of the upper left corner if you take A and multiply it by A transpose.

ANSWER: **77** or **seventy-seven**

Team A: Give the entry of the bottom right corner if you take A and multiply it by A transpose.

ANSWER: **365** or **three hundred sixty-five**

Tossup: This kind of matrix represents a self-adjoint operator, which means that this property of a matrix is the “real” equivalent of a complex matrix that is equal to its conjugate-transpose. Multiplying a matrix by its transpose will always produce a matrix with this property, whose “skew” form features negative numbers in one of its triangular components. In this type of matrix, an entry in the qth (**kyooth**) row and rth (**arth**) column will always be equal to an entry in the rth (**arth**) row and qth (**kyooth**) column. Name this property of a matrix which also names a property in which a shape can be folded in half along some line.

ANSWER: **symmetric** matrix [or matrix with **symmetry**]

**World History: Name these conflicts.**

Team A: General Jose Estigarribia (ess-tee-hah-REE-bee-uh) led the winning side in this war, which was fought in the 1930s between Bolivia and Paraguay.

ANSWER: Gran Chaco War [accept Guerra del Gran Chaco]

Team B: A massacre on the island of Chios (KEE-ohss) occurred early in this 1821 to 1829 war, during which the Ottomans were defeated in the naval Battle of Navarino.

ANSWER: Greek War of Independence [accept clear-knowledge equivalents including the notions of Greece and independence]

Tossup: Prior to its start, one leader in this conflict personally executed Raynald of Chatillon (SHAA-tee-yahn). During this war, the Massacre of Ayyadieh (“eye”-ah-DEE-uh) was carried out by one leader, who shortly thereafter helped establish Guy of Lusignan (gee “of” loo-seen-YAHN) as the first ruler of the Kingdom of Cyprus. One side in this conflict won the Battle of Arsuf despite an unexpected charge undertaken by the Knights Hospitaller. A nearly two-year Siege of Acre (AH-kur) occurred during this conflict, which ended with a truce after the Battle of Jaffa was lost by Saladin. In 1187, Pope Gregory VIII (“the 8th”) called for the start of what religious conflict fought by Richard the Lionheart?

ANSWER: Third Crusade or Kings’ Crusade [prompt on partial answer]

**Fine Arts: Name the following related to painters appearing in other artist’s works.**

Team B: In one work, this artist depicted Claude Monet “painting by the edge of a wood.” His best known painting depicts Virginie Gautreau (veer-zhuh-nee goh-troh) in a black dress.

ANSWER: John Singer Sargent

Team A: The studio of artist Gustave Moreau (morr-oh) was the subject of one painting by this man, who is better known for a painting in which five nude women hold hands in a circle in front of a blue and green background.

ANSWER: Henri Matisse (awn-ree mah-teess) [or Henri-Emile-Benoit Matisse]

Tossup: This artist was the subject of a painting by Salvador Dali which depicts his ghost being “used as a table.” One painting by this artist is thought to depict Antonie van Leeuwenhoek (ANN-toh-nee von LAY-ven-“hook”), who reaches out his right hand to touch a globe. In one painting, this artist of *The Astronomer* depicts an instructor standing next to a girl who plays the virginals. In another of his works, he depicted himself painting a girl who holds a trumpet in front of a large map. This artist of *The Music Lesson* and *The Allegory of Painting* is better known for a landscape painting of his hometown and a work that depicts a girl who wears a blue and yellow headscarf with the title jewelry. Name this Dutch painter of *View of Delft* and *Girl with a Pearl Earring*.

ANSWER: Jan Vermeer (yahn vur-MEER) [or Johan Vermeer or Johannes Vermeer]

**Life Science: Identify the following about ecology.**

Team A: After a destructive event, such as a forest fire, the “primary” type of this process often occurs. This process is the growth of new species in an environment.

ANSWER: ecological **succession** [accept primary **succession**]

Team B: This is the term for the first new species that engages in ecological succession. Swordferns are often said to be one of these on newly created volcanic islands.

ANSWER: **pioneer** species

Tossup: This term was coined by Pierre-Joseph van Beneden in the 1875 book *Animal Parasites and Messmates*, which presented around 250 examples of this interaction. Two examples of this kind of relationship are phoresy, used by mites, and meta-biosis, used by maggots. The classic example of this situation is barnacles attached to the bottom of whales. Name this kind of relationship between two organisms in which one benefits while the other is unharmed, in contrast to parasitism and mutualism.

ANSWER: **commensalism**

**World Literature: Name the following related to the mention of dogs in literature.**

Team B: This bank employee is stabbed to death “like a dog” at the end of Franz Kafka’s novel *The Trial*.

ANSWER: **Joseph K.** (YOH-seff KAH) [accept either underlined portion]

Team A: A dog named Karenin gets cancer in this Milan Kundera (MIH-lahn KOON-dair-uh) novel that centers on the married couple Tomas (toh-MAHSH) and Tereza (tuh-RAY-zah).

ANSWER: *The **Unbearable Lightness of Being***

Tossup: This author included a dog named Merrylegs in a novel in which a mine-shaft accident claims the life of Stephen Blackpool. In that novel by this author, a circus owner abandons his daughter, Sissy Jupe, in Coketown, where she is forced to learn “facts” by a friend and associate of Josiah Bounderby named Thomas Gradgrind. Another novel by this author features a woman who constantly knits names into her register. That woman, Madame Defarge, appears in a novel by this author in which the same woman is loved by both Sydney Carton and Charles Darnay in the years leading up to the French Revolution. Name this English author of *Hard Times* and *A Tale of Two Cities*.

ANSWER: Charles John Huffam **Dickens**

**U.S. Government/Economics: Answer the following about economic treatises.**

Team A: This contemporary French economist wrote about wealth inequality in his book *Capital in the Twenty-First Century*.

ANSWER: Thomas Piketty

Team B: Attacks on David Lloyd George's competency and the Treaty of Versailles (vur-"SIGH") appear in this John Maynard Keynes ("canes") book that discusses the economic aftermath of World War 1.

ANSWER: *The Economic Consequences of the Peace*

Tossup: In one work, this author argued that universities should only pursue "disinterested knowledge" and that athletics and vocational education should not be pursued, since they lead to a "salesmanship" mentality. In another book, this author of *The Higher Learning in America* argued that participation in sports, such as football, leads to "community cohesion" and is partly responsible for people engaging in "devout observances." In that book, this author discussed how those who prefer not to work only wish to engage in "pecuniary emulation" and "conspicuous consumption." Name this Norwegian-American sociologist who wrote *The Theory of the Leisure Class*.

ANSWER: Thorstein Bunde Veblen [or Torsten Bunde Veblen]

**Physical Science: Answer the following about heat.**

Team B: This German scientist's formulation of the second law of thermodynamics casts it in terms of "passage of heat." With Emile Clapeyron (ay-MEEL KLAP-uh-ron), he names an equation describing phase transitions.

ANSWER: Rudolf Julius Emanuel Clausius (KLAW-zee-us) [or Rudolf Gottlieb]

Team A: The third law of thermodynamics states that the "perfect" kind of this substance has no entropy at absolute zero. These substances are divided into seven different types of families, including mono·clinic and ortho·rhombic.

ANSWER: crystal [or crystalline solid or crystalline substance; accept perfect crystal]

Tossup: One form of this technique works by reversing the Brayton Cycle to initiate the Bell Coleman Cycle. The "thermo·electric" form of this technique is done by using the Peltier (pell-tee-ay) effect and requires no moving parts. There exists vapor-compression and vapor-absorption forms of this technique, which was first mathematically derived by Sadi Carnot (sah-dee kar-noh). In general, this technique uses a heat pump to alter temperature. Heat is moved from one location to another via what technique that gives its name to a household appliance?

ANSWER: refrigeration [accept word forms; accept thermoelectric refrigeration or vapor-compression refrigeration or vapor-absorption refrigeration; prompt on "cooling" or word forms]

**World Geography: Give the following related to mountains or mountain ranges.**

Team A: This mountain range, which runs north-south along the eastern end of Australia, contains the continent's highest peak, Mount Kosciuszko (kah-zee-OH-skoh or kosh-CHOOSH-koh).

ANSWER: Great Dividing Range [or Eastern Highlands; prompt on partial answers]

Team B: A 24,000 foot mountain known as "Victory Peak" is the highest point in these "celestial mountains," which are north of the Taklamakan (TAH-kloh-muh-KAHN) Desert and run along China's border with Kyrgyzstan (KEER-guh-stahn).

ANSWER: Tian Shan or Tien Shan [or Khan Tengri or Tengri-Too or Tenger Uul]

Tossup: The northeast part of this nation is dominated by the Adrar des Ifoghas (ah-DRAHR dee ee-FOH-gah) mountains, which are located within its Kidal Region. Within this country, the rapidly shrinking Lake Faguibine (FAG-uh-"bean") is just west of a city that contains Sankore (sahn-KOH-ray) University, which was established in the 14th century. The most populous city in its eastern regions is Gao, which served as the capital of the Songhai ("SONG-high") Empire. The southern boundary of this country borders the nations of Cote d'Ivoire ("coat" dee-VWAR), Guinea, and Burkina Faso (bur-KEE-nah FAH-soh). Name this West African nation which contains the cities of Bamako (BAH-mah-koh) and Timbuktu.

ANSWER: Republic of Mali [or Republique du Mali]

**U.S. History: Give the following related to the colonial history of the United States.**

Team B: This Native American tribe of Massachusetts fought against American colonists in King Philip's War under the leadership of Metacomet.

ANSWER: Wampanoag (WAHM-puh-noh-ag) [or Wopanaak]

Team A: The construction of the fortifications that ran along present-day Wall Street in New York City was overseen by this final Director-General of the New Netherland colony, which this man was forced to surrender to the British in 1664.

ANSWER: Peter Stuyvesant (STY-vuh-sunt)

Tossup: The boundaries of this colony were expanded with the so-called "New Purchase" that was part of the Treaty of Fort Stanwix. One version of this colony's constitution, the Frame of Government, was known as the Charter of Privileges. During the Revolutionary War, heavy fog contributed to a Continental Army loss in this colony's Battle of Germantown. The founding of this colony was known as the "Holy Experiment." Present-day Delaware was originally part of this colony, whose southern boundary was confirmed by the Mason-Dixon line to settle a dispute with the Calvert family. Name this colony founded by a Quaker named William.

ANSWER: Pennsylvania Colony or [Province of Pennsylvania]

### Alphabet Round – Letter T

1. The day of the Week “Tuesday” derives its name from this Norse god of war.
2. 14 year old African-American who had a highly publicized 1955 open casket funeral after being brutally murdered in Money, Mississippi for allegedly flirting with a white woman.
3. 1000 gigabytes comprise one of these units.
4. **(TWO WORD ANSWER)** – This a chord consisting of three adjacent notes, like F, F sharp, G. *The Tides of Manaunaun* is a piece by Henry Cowell that uses them frequently.
5. This novelist, who wrote amusingly titled books such as *Rachel Ray* and *Is He Popenjoy?*, is more famous for writing *The Barsetshire Chronicles*.
6. Nation in which the continuously burning gas fire known as the “Door to Hell” is due north of its capital city, Ashgabat.
7. Englishman who was the primary leader of the 1381 Peasants’ Revolt.
8. **(MULTI-WORD ANSWER)** – In *Democracy in America*, this four word English phrase is used to describe how the interests of many would suppress the interests of the ones that are part of the minority.
9. This type of substance is defined as any agent that potentially induces physiological defects in an organism. Agent Orange is this type of substance.
10. These Occitan poets of the Middle Ages were assisted by jongleurs and wrote about courtly love; famous ones include Jaufre Rudel and Bernart de Ventadorn.
11. **(TWO WORD ANSWER)** – Placido Domingo, Luciano Pavarotti, and Jose Carreras comprised this group of operatic performers who were active during the 1990s and 2000s.
12. **(TWO WORD ANSWER)** – Rebel organization which was defeated in the 26-year Sri Lanka Civil War.
13. This pre-Socratic philosopher was the first to predict an eclipse and believed that water was the fundamental component of the visible world.
14. These detritivores of group Isoptera often build giant mounds. Their consumption of cellulose often causes buildings to be structurally unstable.
15. The nihilist Bazarov appears in this Russia author’s *Fathers and Sons*.
16. The Bon religion was the ancient religion of this region of western China.
17. Carrie Nation was a leader of this social movement that opposed the consumption of alcohol.
18. **(HYPHENATED ANSWER)** – Title number of “views of Mount Fuji” depicted in a 19th century series by Japanese artist Hokusai.
19. **(TWO WORD ANSWER)** – The viscosity of a fluid can be determined by using a sphere, Stokes’ Law, the liquid’s density, and this other value, which is reached when drag equals the force of gravity.
20. American author of the novel *The Magnificent Ambersons*.

### Alphabet Round – Letter T Answers

1. **Tyr** (teer)
2. Emmett Louis **Till**
3. **tera·byte** [accept **tebi·byte**]
4. **tone clusters** (TWO WORD ANSWER)
5. Anthony **Trollope**
6. **Turkmenistan**
7. Wat **Tyler** [or Walter **Tyler**]
8. **tyranny of the majority** or **tyranny of the masses** (MULTI-WORD ANSWER)
9. **teratogen** (tuh-RAT-uh-jin)
10. **troubadours** (“TRUE”-buh-dorz)
11. The **Three Tenors** (TWO WORD ANSWER)
12. **Tamil Tigers** (TWO WORD ANSWER)
13. **Thales** (THAY-leez) of Miletus
14. **termites** [or **termitoidae**]
15. Ivan (ee-VAHN) Sergeyevich **Turgenev** (tur-GAYN-yeff)
16. **Tibet**
17. **temperance** movement
18. **thirty-six** [accept **Thirty-six Views of Mount Fuji**] (HYPHENATED ANSWER)
19. **terminal velocity** [accept **terminal speed**] (TWO WORD ANSWER)
20. Newton Booth **Tarkington**

### Lightning Round

1. In one of this author's novels, Alexander Cold journeys to the Amazon, where he finds a metropolis inside an inactive volcano. This author of *City of the Beasts* wrote another novel which ends with Alba sitting inside the vast mansion of her grandfather. In that novel by this author, Esteban works as a miner to earn money so that he can marry Rosa the Beautiful. The politics surrounding the Trueba (troo-AY-bah) family is documented in *The House of the Spirits*, which is a novel by what female Chilean author?

ANSWER: Isabel Allende ("eye"-YEN-day) Llona

2. Most of this city's Jewish population worships at the Sha'ar Hashamayim (shah-"ARE" hash-uh-MY-ihm) Synagogue. Many residents in this city have their trash removed by informal garbage collectors known as Zabbaleen. Its tallest structure, which is known as this city's "Tower," is just south of the 6th October Bridge on Gezira (juh-ZEE-ruh) Island. The Saqqara (suh-KAR-uh) necropolis is just south of this city, which saw massive 2011 protests at Tahrir (tah-REER) Square. Name this city on the east bank of the Nile River this is the most populous in Egypt.

ANSWER: Cairo, Egypt [or al-Qahirah]

3. One song on this album is a ballad that is based on an improvisation to the opening theme of another song called "Peace Piece." Another song on this modal album, which is partly named for the color green, was written by Bill Evans. This album, which contains the songs "Flamenco Sketches" and "Blue in Green" is most likely the best-selling jazz album of all time. Name this 1959 Miles Davis album named for a color.

ANSWER: Kind of Blue

4. The eastern border of this country was settled by the Treaty of Zgorzelec ("SCORE"-zell-ihk). One leader of this nation espoused "consumer socialism" and was succeeded by Egon Krenz (AY-gawn KRENZ). While led by Walter Ulbricht, this country oversaw the construction of a structure that was demolished shortly after the resignation of its penultimate ruler, Erich Honecker (HOH-nih-ker). The Stasi (STAH-zee) was the secret police of what communist nation that was unified with its western neighbor after the fall of the Berlin Wall?

ANSWER: East Germany [or German Democratic Republic or GDR or Deutsche Demokratische Republik or DDR; do not accept or prompt on "Germany" by itself]

5. These devices can use a sapphire crystal doped with titanium or a YAG ("Y-A-G") crystal doped with neodymium. These devices consist of a (\*) resonator cavity and a gain medium. In these devices, optical pumping is used to excite electrons, which then undergo (\*\*) stimulated emission to produce photons of a given frequency. Name these light-emitting devices often used in namesake "pointers."

ANSWER: lasers [accept laser pointers; accept light amplification by stimulated emission of radiation before (\*\*) and prompt thereafter; prompt on "gain medium" before (\*)]

6. The final phase of this meeting occurred primarily due to the efforts of Charles Borromeo. Many of its decrees concluded with the phrase "let him be anathema (uh-NATH-uh-muh)." Due to a plague, this meeting was moved for a short time to Bologna (boh-LOHN-yuh). An index of prohibited books was compiled by Pope Paul IV ("the 4th") during this meeting, which reaffirmed the seven sacraments, defined transubstantiation, and rejected the doctrine of justification by faith alone. Name this ecumenical council that took place in northern Italy between 1545 and 1563 in response to the Protestant Reformation.

ANSWER: Council of Trent [or Concilium Tridentinum]

7. This author discussed the "play drive" in man in his *Letters on the Aesthetic Education of Man*. *The Piccolomini*, as well as the "death" and "camp" of the title character, comprise this man's trilogy about the Thirty Years' War named *Wallenstein*. The evil governor Gessler forces the title character to shoot an apple off of his son's head in a drama by this author espousing Swiss nationalistic sentiments. Name this German Romantic playwright who wrote *William Tell*.

ANSWER: Johann Christoph Friedrich von Schiller



8. The background of one of these works includes a painting in which a group of Japanese women stand next to a body of water overlooking Mt. Fuji. Harvard's Fogg Museum owns one of these works "dedicated to Gauguin (goh-GAHN)." Several of these works were painted "with straw hat." Shortly before moving to Saint-Remy (sahn-ray-mee), the artist of these works painted two of them "with bandaged ear." Name these paintings both created by and depicting the artist of *Portrait of Dr. Gachet* (gah-SHAY).

ANSWER: **self-portraits** of Vincent Willem **van Gogh** [both parts required; accept clear knowledge equivalents that include **van Gogh** and indicate the artist **painting** a picture of **himself**; prompt on partial answers and answers that mention "portraits" or "paintings" instead of "self-portraits"]

9. Cities within this empire were ruled by individuals known as tlatoani (t'laht-oh-AH-nee). Bernardino de Sahagun (sah-hah-GOON) compiled a history of this empire in the *Florentine Codex*. This empire forged a "triple alliance" that included the city of Tlacopan (tuh-LAH-koh-pahn). The capital of this empire was supposedly founded on the spot where an eagle was seen eating a snake atop a cactus; that location was an island within Lake Texcoco (tess-KOH-koh). Tenochtitlan (tay-NOHCH-teet-LAHN) was the capital of what Mexican civilization that was ruled by Montezuma (mon-tuh-ZOO-muh) when it was conquered by Hernan Cortez?

ANSWER: **Aztec** Empire or **Aztecs** [or **aztecas** or **Aztec Triple Alliance** or **Mexicas** ("may"-SHEE-kahz) or **Tenochcas** (teh-NOHCH-kuz) or **Excen Tlahtoloyan**]

10. This scientist examined partial differential equations that appear in nature, as well as the origin of natural patterns, in his paper "The Chemical Basis of Morphogenesis." Leslie Lamport and Donald Knuth (k'NOOTH) have won this man's namesake award for their work on Tex. A model developed by this man features an infinite tape and a read-write tape. Give this 20th century British computer scientist who names a type of "machine."

ANSWER: Alan Mathison **Turing** [accept **Turing machine**]

11. One speech during this event noted that "we did not, in the words of Lincoln, adhere to the 'dogmas of the quiet past'." During this event, one speaker asked four successive questions, the first of which was "how do we give everyone a fair shot at opportunity and security in this new economy?" Ohio Representative Jim Jordan gave tickets to controversial county clerk Kim Davis to attend this event, which saw Nikki Haley deliver the Republican response. Name this January (\*) 2016 address by Barack Obama.

ANSWER: **2016 State of the Union** Address [accept **State of the Union** after (\*); prompt on "State of the Union" before (\*)]

12. The speaker of this poem parenthetically mentions "committed linnets" to describe his act of "sing[ing] the sweetness, mercy, majesty and glories" of his "king." In the opening stanza of this poem, "Love, with unconfined wings, \ Hovers within" the speaker's Gates, causing it to bring the "divine" title woman "to whisper at the Grates." The lines "Stone walls do not a prison make, / Nor iron bars a cage" appear in what work by the "Cavalier Poet" Richard Lovelace?

ANSWER: "**To Althaea from Prison**"

13. According to legend, this man ordered his troops to carry dirt in their helmets to construct a hill where the Italian city of Udine (EW-dee-nuh) was founded. It is said that the prayers of Saint Genevieve prevented Paris from being attacked by this ruler, who led one campaign to secure a marriage with Honoria, the sister of Valentinian III. Bleda was the brother of and co-ruler with this man, who was defeated by a Visigoth and Roman coalition at the Battle of Chalons (shah-LOHN) in AD 451. Name this ruler of the Huns.

ANSWER: **Attila** the Hun

14. This condition is named from the Latin word for "sausage" since it was originally called "sausage sickness." A company named Allergan manufactures a chemical caused by this infection to treat spasms. Parents are advised not to feed honey to infants due to the risk of this infection, which may cause floppy baby syndrome. This infection is caused by a *Clostridium* bacteria, and the toxins that cause this infection are also used for botox treatments. Name this foodborne disease which paralyzes most people it infects.

ANSWER: **botulism**

15. This composer's opus 54 depicts a "March of the Dwarfs" and "Bell ringing;" that work is part of a larger set of 66 works written for solo piano. Like Robert Schumann, this composer wrote a piano concerto in A minor, but his begins with a timpani roll. This composer of the *Lyric Pieces* included the song "In the Hall of the Mountain King" in his incidental music to *Peer Gynt* ("peer" ghint). Name this 19th and 20th century composer from Norway.

ANSWER: Edvard Hagerup **Grieg** (greeg)

16. This deity turned King Lyncus (LINK-iss) into a lynx to prevent him from committing a murder. This deity cursed Erysichthon ("air"-ih-"SICK"-thahn) with an insatiable hunger that caused him to eat himself. After being shown kindness by King Celeus (SEE-lee-uss), this goddess tried to give immortality to Demophon (DEM-oh-fawn) and disclosed a secret to Triptolemus (trip-TAHL-uh-muss). The Eleusinian (el-yoo-SIN-ee-un) Mysteries honored this goddess and her daughter, whose eating of pomegranate seeds caused her to be confined for four months out of every year in the underworld. Name this mother of Persephone (pur-SEH-foh-nee) and Greek goddess of agriculture.

ANSWER: **Demeter** (duh-MEE-tur) [do not accept or prompt on "Ceres"]

17. Early in this work, a child is warned that "if you eat three lumps of sugar, your mother will certainly slap you." This novella opens with a meeting in the garden of a hotel in Vevey (veh-VAY), Switzerland. After a visit to the Chateau de Chillon (shaa-TOH deh "SHE-on"), this work's title character meets up in Mrs. Walker's parlor with Winterbourne, who is surprised to learn that the title character has been associating with Giovanelli. The title woman dies of malaria after visiting the Colosseum in Rome in what novella by Henry James?

ANSWER: **Daisy Miller**

18. This English word was the inspiration for the word *semordnilap* (seh-MORD-nih-lap), which is a term coined by Martin Gardner to refer to certain pairs of words, such as "dioramas" and "samaroid." This English word was coined by playwright Ben Jonson, and an example of one used by James Joyce is tattarrattat (tat-uh-rat-tat), which means a "knock on the door." "A man a plan a canal Panama" is sometimes given as an example of what words or phrases which are spelled the same forward and backward?

ANSWER: **palindromes**

19. During one battle at this location, a makeshift hospital was established at Sudley Church. General Fitz John Porter was court martialed following one battle at this location which ended with a retreat from Henry House Hill. Another battle here included the death of Barnard Bee shortly after he commanded his men to "rally behind the Virginians." Irvin McDowell was defeated at the first battle at this location, where Thomas Jackson received his nickname of "Stonewall." Name this Virginia location that was the site of the first major battle of the Civil War.

ANSWER: **Bull Run** or **Manassas** [accept First Battle of **Bull Run** or Second Battle of **Bull Run** or First Battle of **Manassas** or Second Battle of **Manassas**]

20. One type of this process is measured by the Frank-Tamm formula. The presence of this process can be verified by utilizing objects known as scintillators. The SI unit of energy transfer per unit mass caused by this process is the *gray*. This process is categorized as "ionizing" when it is energetic enough to eject electrons from atoms. The SI unit for the "absorbed dose" of this process is the sievert (SEE-vurt). Geiger counters detect what process in which an unstable nucleus emits electrons or light that is often harmful to humans?

ANSWER: nuclear **radiation** or **radioactivity** [accept Cherenkov **radiation** Cherenkov **radioactivity** or ionizing **radiation** or ionizing **radioactivity**]