

# Scobol Solo 2019

## Packet 2 (Round 2)



1. Rosser's theorem states that the  $n$ th of these numbers is greater than  $n$  times the natural log of  $n$ . Wilson's theorem can be expressed as an equivalence relation that is true for these numbers. The amount of these numbers less than a given number  $x$  is approximated by the formula  $x$  over the natural log of  $x$ . Two of these numbers are called "twins" when they differ by 2; it is unknown whether the number of twins is finite. Euclid [YOOK-lid] proved that there are infinitely many of these numbers by imagining multiplying all of them together and adding 1. Name these counting numbers whose only factors are themselves and 1.

Answer: prime numbers or primes

2. Steve Kessel is leaving this company to go work for GeekWire. This company's major spending on city council races was unsuccessful when Egan Orion [EE-gun oe-"RYE"-un] was defeated by Kshama Sawant [SHAH-muh suh-WANT] in November 2019. One of this company's least successful ventures was a phone with a Dynamic Perspective feature, the Fire Phone. This company owns Whole Foods and Twitch. Its founder, who now owns *The Washington Post*, is Jeff Bezos [BAY-zohss]. Name this company that makes Alexa and is the largest Internet company by revenue in the world.

Answer: Amazon(.com, Inc.)

3. A king of this country was known as "the Unifier" and was killed in 1934 by a man nicknamed "Vlado the Chauffeur". The Anti-Fascist Council for the National Liberation of this country deposed its monarch in 1945 and installed Ivan Ribar [ee-VAHN REE-bar] as president. The next leader of this country worked with India's Jawaharlal [ja-wuh-HAR-lahl] Nehru to create the Non-Aligned Movement and became its first Secretary-General in 1961. The signing of the Dayton Agreement is sometimes considered the end of this country, which broke up during the 1990s. Name this country that was headed by Josip Broz Tito [YOH-sip brohz TEE-toh] and whose first king was called "the head of the Serbs, Croats and Slovenes".

Answer: (Socialist Federalist Republic of) Yugoslavia

4. This composer returned to his job as a taxi driver after his ensemble was unable to attract sizable audiences to his piece "Music in Twelve Parts". One piece by this composer, "Façades", was written for the movie *Koyaanisqatsi* [koh-yahn-uh-SKAHT-see] but not used. This composer refers to his works as "music with repetitive structures", though it is usually described as minimalist. This composer gained fame with an opera without a plot that contains scenes labelled "Train", "Trial", and "Field/Spaceship". He followed that up with an opera loosely based on the life of Mahatma Gandhi. Name this composer of *Einstein on the Beach* and *Satyagraha* [saht-YAH-gruh-huh].

Answer: Philip Glass

5. This novel ends by paraphrasing a quote about Charles of Sweden. Late in this novel, Athelstane [ATH-ul-“stain”] shows up at his own funeral, explaining that he had only been comatose. Another character in this novel is “a victim to the violence of his own contending passions”. That character, who is sometimes called “the Templar”, is this novel’s Brian De Bois-Guilbert. King Richard I dies at the end of this novel, and another character—Locksley—turns out to be Robin Hood. Name this novel in which the title character marries Rowena, written by Walter Scott.

Answer: Ivanhoe

6. The differential of this quantity equals the sum of chemical potential times the differential of the number of molecules for each substance, plus volume times the differential of pressure, minus entropy times the differential of temperature. This quantity is used to determine whether a reaction under constant pressure and temperature is exergonic [ek-sur-GAH-nik] or endergonic, and it can be called “free enthalpy”. This quantity is considered when volume can change. This quantity equals enthalpy minus the product of temperature and entropy. Identify this type of “free energy” named after an American scientist.

Answer: Gibbs free energy or Gibbs function or Gibbs energy [prompt on free energy; accept just Gibbs after “free energy”; accept free enthalpy before it is read; do not prompt on “energy” or “enthalpy”]

7. Thousands of these people were repelled by a few hundred British soldiers led by John Chard at the Battle of Rorke’s Drift. That battle was part of an 1879 war these people fought after being provoked by Henry Bartle Frere. That war started well for these people at the Battle of Isandlwana [i-san-JWAH-nuh] but ended well for the British. These people started gaining power with the 1818 Battle of Gqokli [GO-kee] Hill, where these people surrounded their opponents with the “bull horn” formation. These people now mostly live in a province that merged with Natal [nuh-TOL] in South Africa. Name these people who came to prominence under the leadership of Shaka [SHAH-kuh].

Answer: Zulus [prompt on Bantu or South Africans]

8. One book by this person described the Arapesh [AIR-uh-pesh], Mundugumor [mun-DOO-guh-mor], and Tchambuli [cham-BOO-lee] cultures. According to that book, the Arapesh are more peaceful than the other groups, and among the Tchambuli, the women became dominant after warfare was outlawed. This person studied youth on the island of Ta’u [tah-oo] for a book whose findings were strongly contested by Derek Freeman. According to that book by this author, primitive societies are less focused on monogamous sexual relations than American society. Name this anthropologist who wrote *Sex and Temperament in Three Primitive Societies* and *Coming of Age in Samoa*.

Answer: Margaret Mead

9. In a very short story, this writer said he likes “hourglasses, maps, 18th-century typography, the taste of coffee, and the prose of Stevenson”. That story ends “I do not know which of us has written this page.” Another story by this writer has a character who shares his name with the location of an artillery park, and who is translating Ts’ui Pên’s novel into English. This author also wrote about a building whose circumference is inaccessible and whose rooms are hexagons. That building contains books that are each 410 pages long. Name this author of “The Garden of Forking Paths” and “The Library of Babel”, both of which are in his collection *Ficciones* [feek-see-OH-nayss].

Answer: Jorge Luis Borges [hor-hay loo-ees BOR-hayss] (Acevedo) (The first story mentioned is “Borges and I”.)

10. In one drawing by this artist, Yvette Guilbert [zheel-bair] is recognizable by her black gloves even though her head is out of view. A drawing by this artist whose only color is a red dress has the words “Petit [peh-tee] Casino” written across it. That work shows the Irish singer May Belfort when she was in Paris. This artist showed an orange-haired woman dressed entirely in black in *Divan Japonais* [dee-vahn zhah-poh-nay]. That woman, who is in many of this artist’s works, is Jane Avril. This illustrator often portrayed Parisian nightlife in his posters. Name this artist who portrayed a blue-faced woman at the right side of his painting *At the Moulin Rouge* [moo-lun rooj].

Answer: Henri de Toulouse-Lautrec [awn-ree day too-looss loh-trec] [prompt on partial last name]

11. The functioning of this organelle is attacked by the poison ricin [“RICE-in”]. This organelle is blocked by antibiotics such as strepto·mycin [strep-toh-MY-sin] and tetra·cycline [TET-ruh-SY-kleen]. A magnesium ion activates an adenine [AD-uh-neen] base in these organelles when they perform their main function. These organelles have two subunits that join together when there is messenger RNA between them; those subunits are measured in Svedberg units. These organelles are attached to the sides of the rough endo·plasmic reticulum [reh-TIK-yoo-lum]. Name these small organelles that use messenger RNA and transfer RNA to synthesize proteins during translation.

Answer: ribosomes

12. In 1856, control of this country was taken by a U.S. adventurer named William Walker. In the late 19th and early 20th centuries, this country was led by José Santos Zelaya until the U.S. supported rebels against him; soon after that, the U.S. negotiated the Bryan-Chamorro Treaty with this country. For much of the 20th century, this country was led by the Somoza [suh-MOH-zuh] family. After the Somoza family was toppled in 1979, some of its supporters joined a rebel group in this country called the Contras. Name this Central American country where the Contras gained the support of the Reagan Administration to oppose the Sandinistas, who were led by Daniel Ortega.

Answer: (Republic of) Nicaragua [or (República de) Nicaragua]

13. A man in this play tells his wife “You keep forgetting the conditions on which I agreed to stay on living with you”, and she replies “I’m not living with you. We occupy the same cage.” The wife in this play is upset with her husband because he broke his ankle while jumping hurdles at 2 or 3 in the morning. That wife is also upset because Gooper and Mae are trying to inherit her father-in-law’s estate. Several of the characters in this play are aware that the family patriarch is dying of cancer. Name this play featuring arguments between Brick and Maggie at the home of Big Daddy Pollitt, written by Tennessee Williams.

Answer: Cat on a Hot Tin Roof

14. A bronze sculpture by this artist of a seated woman has an owl that is nearly hidden. That work is Columbia University’s *Alma Mater*. A bronze sculpture by this artist shows a young clergyman with an open book on his knee. That work in Harvard Yard depicts John Harvard. The most famous work by this sculptor was carved by the Piccirilli [peet-chee-REE-lee] Brothers and is a 19-foot-tall work showing a seated man underneath a caption that begins “In this temple as in the hearts of the people”. There is disagreement over whether that man is giving his initials in sign language. Name this person who sculpted Abraham Lincoln for the Lincoln Memorial.

Answer: Daniel Chester French

15. The derivative of the efficiency of a part of this device with respect to stored energy [pause] is the reciprocal of the saturation energy. The “pumping” named for this device causes an excited state to be more common than the ground state. Yttrium [IT-ree-um] aluminum garnet and indium gallium arsenide [IN-dee-um GAL-ee-um AR-suh-nyd] are commonly used in these devices as a gain medium, which undergoes population inversion inside the optical resonators of these devices. These objects output coherent light of a single color. The name of these objects is an acronym for a phrase including the words “stimulated emission of radiation”. Name these devices that are used to perform eye surgery and read bar codes.

Answer: lasers

16. When Jesus went to revive Lazarus, this disciple said “Let us also go, that we may die with him.” This disciple’s name means “twin” in Aramaic, and he was sometimes known as Didymus [DID-uh-muss], the Greek word for “twin”. The last words attributed to this person are “My Lord and my God”, which he said shortly after Jesus entered a locked house. Before that, this person said “Unless I see the nail marks in his hands and put my finger where the nails were, and put my hand into his side, I will not believe.” Name this apostle who was told “Reach out your hand and put it into my side. Stop doubting and believe.”

Answer: (St.) Thomas (the Apostle) [accept Doubting Thomas; accept Didymus before it is mentioned]

17. The narrator of this poem tells his audience “You and I are old.” The narrator of this poem pledges “to follow knowledge like a sinking star” before leaving “the sceptre and the isle” to his son. The narrator of this poems states “I am a part of all that I have met.” This work is an early example of a dramatic monologue, and it was written by the same poet and inspired by the same death as “In Memoriam A.H.H.” It ends with the line “To strive, to seek, to find, and not to yield”. Identify this Alfred, Lord Tennyson poem whose title is the Latin name of Odysseus.

Answer: “Ulysses”

18. This man’s older daughter Eliza was born on the steamboat *Gipse*y on the Mississippi River. He married Harriet at Fort Snelling after leaving Rock Island, Illinois. A statue portraying this man and his wife is just outside the Old Courthouse in St. Louis. John McLean and Benjamin Robbins Curtis wrote dissents supporting this person and the Missouri Compromise, while Roger Taney [TAW-nee] became hated by Northerners because of his written opinion against this person. Name this slave who was denied the rights of citizenship in an 1857 Supreme Court case against his owner, John Sanford.

Answer: Dred Scott

19. A picture of the sixth of these devices was taken in 2019 near Vera Rubin Ridge at Woodland Bay by the High Resolution Imaging Science Experiment. Europe and Russia are teaming up to build *Rosalind Franklin*, which could be the seventh of these devices. The first successful one of these devices was part of the Pathfinder mission in 1997. These devices recently have searched for life and prepared for human exploration, and they are managed by the Jet Propulsion Laboratory. Give the collective name for *Sojourner*, *Opportunity*, *Spirit*, and *Curiosity*, which are mobile vehicles on another planet.

Answer: Mars rovers [prompt on descriptive answers like robot vehicles on Mars as long as they specify Mars; do not prompt on answers that are neither rover nor specify Mars]

20. This place contains a lake of the same name that has a southeast arm, a south arm, and a west thumb. This place also contains a caldera of the same name, which is sometimes referred to as a super-volcano. The bison herd in this place is believed to be the oldest and biggest in the United States. This place comprises parts of three states and has noteworthy features named Steamboat and Beehive. Those features of this national park send water and steam into the air, sometimes at regular intervals. Name this national park that contains Old Faithful and many other geysers.

Answer: Yellowstone National Park

***This is the end of regulation. Check the score. If it is tied, proceed to overtime tossups. If it is not tied, the game is over.***

<sup>TB</sup>21. In Stirling’s approximation of factorials,  $n$  is divided by this number before being raised to a power. This number also equals the hyperbolic sine of 1 plus the hyperbolic cosine of 1. This number is the limit of the sum of one divided by  $n$  factorial as  $n$  goes from zero to infinity. If the derivative of a function equals the original function, then the original function is a constant times this number raised to a power. This number also equals the limit as  $x$  approaches infinity of the quantity one plus one over  $x$ , end quantity, to the  $x$  power. Name this irrational number that is used as the base of natural logs and is approximately equal to 2.718.

Answer:  $e$  [accept Euler’s number or Napier’s constant; do not accept or prompt on “Euler’s constant”]

***If the score is still tied, continue. If it is not tied, the game is over.***

<sup>TB</sup>22. In one novel by this author, Roxy switches her son Chambers with Tom Driscoll when the boys are a few months old so that her son will not be a slave. That novel, whose chapters begin with quotes from the title character’s calendar, is *Pudd’nhead Wilson*. Another novel by this author begins with the title character convincing other children that they should whitewash his aunt’s fence. In a novel by this author that involves some of the same characters, the fence-trickster’s best friend travels with the escaped slave Jim on the Mississippi River. Name this author of *The Adventures of Tom Sawyer* and *Adventures of Huckleberry Finn*.

Answer: Mark Twain [or Samuel Langhorne Clemens]

***If the score is still tied, continue. If it is not tied, the game is over.***

<sup>TB</sup>23. Toby Litt wrote a book titled for this kind of building that is subtitled *A Dream-Vision*. Bellevue in Manhattan was the first public type of this building in the United States, and other prominent examples include Massachusetts General, Mayo, and the Cleveland Clinic. Name this type of building where very sick people get treated.

Answer: hospital(s) [prompt on clinic(s)]

***There are no more overtime questions available. If the score is still tied, contact the control room for further instructions. If it is not tied, the game is over.***