Scobol Solo 2022
Packet 4 (Round 4)

1. None of these numbers have 2 as the units digit, and the only examples that have 6 as the units digit have an odd tens digit. One of Lagrange's [luh-grahnj'z] theorems states that every natural number can be written as the sum of four of these numbers. The sum of two consecutive triangular numbers equals one of these numbers. These numbers can be generated by adding all consecutive, positive odd numbers starting from 1, such as "$1 + 3 + 5$" and "$1 + 3 + 5 + 7$". Each Pythagorean triple corresponds to a case in which two of these numbers are added to give another one of these numbers. Identify these numbers such as 1, 4, 9, 16, and 25.

   Answer: perfect <u>square</u>s or <u>square</u> numbers

2. The size of this collection is still growing, with about 200 new pieces discovered in 2021 and about 20 discovered at the beginning of 2022. Because of the production process, the soil around this collection is high in mercury. This collection was initially discovered by farmers in 1974 and includes close to 10,000 pieces, some of which are horses and chariots. Of the human-like figures that are part of this collection, the ones of higher rank tend to be taller than the others. Name these sculptures created for the tomb of Qin [chin] Shi Huang, who was the first Emperor of China.
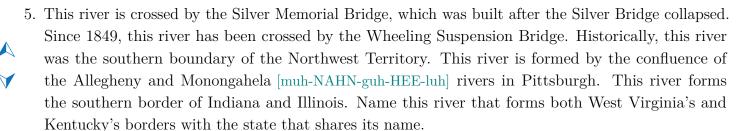
   Answer: <u>Terracotta</u> (Spirit) <u>Army</u> (of the First Qin Emperor) or or <u>Terracotta Soldiers</u> or <u>Terracotta Warrior</u>s and Horses [or <u>bingma yong</u>]

3. One poem by this writer refers to "the he-bird, the solitary guest from Alabama". In that poem by this writer, a boy gives words to a bird whose mate does not return to the nest. This author of "Out of the Cradle Endlessly Rocking" wrote another poem that states "For every atom belonging to me as good belongs to you." In the same poem, this person wrote "I am large, I contain multitudes." This poet wrote "Our fearful trip is done" in one of several poems he wrote in memory of Abraham Lincoln. Name this poet whose "Song of Myself" and "O Captain! My Captain!" were included in his *Leaves of Grass*.

   Answer: Walt(er) <u>Whitman</u>

4. Tensions in this country came to a head shortly after the presidencies of Emiliano Chamorro Vargas and José María Moncada, when Juan Bautista Sacasa [sah-KAH-sah] allowed Anastasio Somoza [soh-MOH-zah] García to become the head of this country's national guard. Somoza, who would later rule this country, ordered the assassination of Augusto Sandino. Years later, this country's Sandinistas were opposed by Contras, who were illegally funded by the United States. Former Sandinista leader Daniel Ortega is now this country's president. Name this country between Honduras and Costa Rica, whose capital is Managua.

   Answer: (Republic of) <u>Nicaragua</u> [or (República de) <u>Nicaragua</u>]

5. This river is crossed by the Silver Memorial Bridge, which was built after the Silver Bridge collapsed. Since 1849, this river has been crossed by the Wheeling Suspension Bridge. Historically, this river was the southern boundary of the Northwest Territory. This river is formed by the confluence of the Allegheny and Monongahela [muh-NAHN-guh-HEE-luh] rivers in Pittsburgh. This river forms the southern border of Indiana and Illinois. Name this river that forms both West Virginia's and Kentucky's borders with the state that shares its name.

Answer: <u>Ohio</u> River

Check the score.

6. For devising a set of non-linear differential equations that modeled this type of cell in squids, Alan Hodgkin and Andrew Huxley shared a Nobel Prize. Some of these cells can be classified as Betz cells, Lugaro cells, or Purkinje [per-KIN-jee] cells. These cells are often classified as motor or sensory. The long branch from the soma of one of these cells is covered by a myelin ["MY"-uh-lin] sheath. These cells send signals out through axons and receive signals in through dend·rites. Name these cells that make up or communicate with the spinal cord and brain.
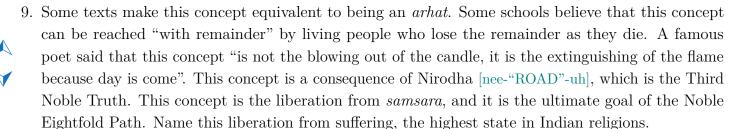
Answer: <u>neuron</u>s [accept <u>nerve</u> cells or <u>nerve</u>s]

7. At the beginning of this short story, a boy whose name is pronounced "Dickie Dellacroy" is working with Bobby and Harry Jones to prevent raids by other boys. The last spoken words in this story are "It isn't fair, it isn't right." This story describes Mr. Graves setting up a three-legged stool and Mr. Summers putting a black box on it. In this short story, that box contains several slips of paper, one of which is marked. The claims that the ritual described in this story isn't fair are made by Tessie Hutchinson, who eventually has stones thrown at her. Name this story by Shirley Jackson.

Answer: "The <u>Lottery</u>"

8. A lawsuit initiated in this state in 1990 by Ninia [nee-NEE-uh] Baehr led to national and state laws preventing the recognition of same-sex marriages. This U.S. state was represented in the Senate by Daniel Inouye [ee-NOH-ay] from 1963 until his death in 2012. The only president born in this state was Barack Obama. In 1993, President Clinton signed an apology for the U.S. overthrowing the monarchy that had ruled what is now this state in 1893, when Sanford B. Dole replaced Queen Lili'uokalani [lee-lee-oo-OH-kuh-LAH-nee]. Name this state that became the 50th state, just after Alaska.

Answer: <u>Hawaii</u>

9. Some texts make this concept equivalent to being an *arhat*. Some schools believe that this concept can be reached "with remainder" by living people who lose the remainder as they die. A famous poet said that this concept "is not the blowing out of the candle, it is the extinguishing of the flame because day is come". This concept is a consequence of Nirodha [nee-"ROAD"-uh], which is the Third Noble Truth. This concept is the liberation from *samsara*, and it is the ultimate goal of the Noble Eightfold Path. Name this liberation from suffering, the highest state in Indian religions.

   Answer: <u>nirvana</u> [accept <u>nibbana</u>; prompt on <u>Buddhahood</u> or <u>moksha</u> or <u>mukti</u>] (The quote is from Rabindranath Tagore.)

10. The factor named for this quantity equals the cosine of the phase angle in an alternating current circuit. Both radiant flux and luminosity are equivalent to this electrical quantity and measured in the same units. In a circuit, this quantity can be expressed as "current times electric potential difference" or as equivalent expressions using substitutions from Ohm's law. In rotational systems, this quantity equals torque [tork] times angular velocity. This quantity is the dot product of force with velocity. This quantity is the rate at which work is done. Name this quantity measured in watts.

   Answer: <u>power</u>

Check the score.

11. In a story by this writer that was adapted by John Keats, a ghost says to a woman "The last day thou sawest me, thy brothers slew me." That story by this writer inspired the Keats narrative poem *Isabella, or the Pot of Basil*. Shakespeare's *All's Well That Ends Well* is believed to be based on a translation of another story by this author, which is narrated by Neifile [nay-FEE-lay]. This writer's best-known work is set at a villa in the countryside outside of Florence, where 10 people each tell one story a day for 10 days. Name this author of *The Decameron*.

   Answer: Giovanni <u>Boccaccio</u> [joh-VAHN-nee bohk-KAHT-choh]

12. The painter Victorine Meurent [vik-taw-reen myoo-raw] often modeled for this other painter, including for one work showing her next to a girl who is facing away from the viewer and holding the black bars of an iron fence. This painter of *The Railway* also had Meurent model for a work in which an orchid and bracelet suggest that she is a prostitute. In that painting, this painter shows a black servant bringing flowers to a reclining nude white woman. This artist also caused controversy with another painting depicting clothed men having a picnic with a nude woman. Name this French painter of *Olympia* and *The Luncheon on the Grass*.

   Answer: Édouard <u>Manet</u> [ayd-war man-ay] [do not accept "Monet"]

13. This king was married to Gorgo, and he was succeeded by his only son Pleistarchus [ply-STAR-kuss]. This person became king when his half-brother Cleomenes [klee-AH-meh-neez] died mysteriously in prison. This king became a hero when he died while losing a battle during the Second Persian War. That battle was lost after this king's enemy was shown a narrow pass, causing this king to be outflanked. A small group of Thespians and followers of this king fought to the death to make it harder for the Persians to advance. Name this Spartan king who lost to Xerxes [ZURK-seez] I at the Battle of Thermopylae [thur-MAH-puh-lee].

Answer: <u>Leonidas</u> I

14. The James Webb Space Telescope took some pictures of this planet in which its moons Thebe [THEE-bee] and Metis [MEE-tiss] can be seen. Recent research shows that this planet is the oldest in our solar system, and its interior includes what would have been the seeds of other planets. In 1973, *Pioneer 10* did a fly-by of this planet on its way out of the solar system. This planet's many moons include the Galilean moons Io ["EYE-oh"], Callisto, Europa, and Ganymede [GAN-uh-meed]. There is an enormous storm on this planet that has been going on for at least hundreds of years, called the Great Red Spot. Name this largest planet in our solar system.
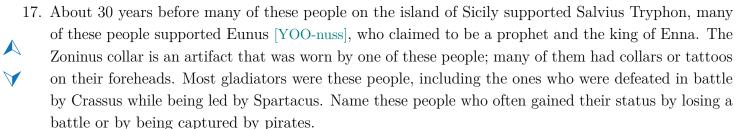
Answer: <u>Jupiter</u>

15. A character in this play is told to put "what forgeries you please" on another character. When Reynaldo suggests gaming, he is also given the suggestions "drinking, fencing, swearing, quarrelling, drabbing". Those suggestions are by the same character who, in this play, gives the advice "Neither a borrower nor a lender be" and "To thine own self be true." That man, who in this play is the father of Laertes [lay-AIR-teez], is Polonius. The daughter of Polonius, who drowns after being told "get thee to a nunnery" by this play's title character, is Ophelia. Name this play by William Shakespeare set in Denmark.

Answer: *(The Tragedy of) <u>Hamlet</u>(, Prince of Denmark)*

Check the score.

16. This book compares the leader Agathocles [uh-GATH-oh-kleez] of Syracuse to a criminal. According to this book, "A prudent man should always follow in the path trodden by great men and imitate those who are most excellent." This book also recommended that "men ought either to be well treated or crushed." This book was dedicated to Lorenzo de' Medici, and it praises the leadership skills of Cesare Borgia [CHEZ-ar-ay BOR-jah]. The first version of this book was distributed in 1513, a few years before the same author's *Discourses on Livy*, and this book is sometimes viewed as a criticism of Italy's lack of unity. Name this book by Niccolò Machiavelli [mahk-yah-VELL-lee].

Answer: *The <u>Prince</u>* [or *Il <u>Principe</u>* or *De <u>Principatibus</u>*]

17. About 30 years before many of these people on the island of Sicily supported Salvius Tryphon, many of these people supported Eunus [YOO-nuss], who claimed to be a prophet and the king of Enna. The Zoninus collar is an artifact that was worn by one of these people; many of them had collars or tattoos on their foreheads. Most gladiators were these people, including the ones who were defeated in battle by Crassus while being led by Spartacus. Name these people who often gained their status by losing a battle or by being captured by pirates.

    Answer: Roman <u>slave</u>s [or en<u>slave</u>d people; accept <u>servus</u> or <u>doulus</u>]

18. Joshua Bell referred to a chaconne [shuh-KAHN] by this composer as "one of the greatest achievements of any man in history". That chaconne is part of this composer's *Sonatas and Partitas for Solo Violin*. A collection of six concertos by this composer are named for the Prussian royal he gave them to. One collection by this composer is sometimes nicknamed "The 48" because it consists of two sets of preludes and fugues in all 24 major and minor keys. Name this German Baroque composer who wrote the *Brandenburg Concertos* and *The Well-Tempered Clavier [kluh-VEER]*.
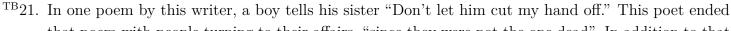
    Answer: Johann Sebastian <u>Bach</u>

19. A new version of this phenomenon was discovered in 2018 and is caused by hindered bond angle inversion. Butane is the simplest alkane to exhibit the constitutional form of this phenomenon. One example of this phenomenon is common in molecules with carbon-carbon double bonds, leading to some molecules being labelled as either *cis* [sis] or *trans*. Chirality [ky-RAL-ih-tee] leads to the "stereo-" form of this phenomenon. Name this phenomenon in which molecules have the same chemical formulas but different arrangements of atoms.
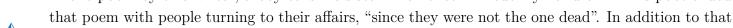
    Answer: <u>isomer</u>ism or <u>isomer</u>s [accept <u>stereoisomer</u>ism or <u>stereoisomer</u>s or <u>chiral</u>ity before "exhibit"]
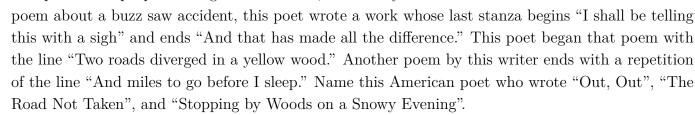
20. This person claims that he and his brother Kimbal used to support their father Errol, but they no longer do because Errol is a "terrible human being". In 2022 this person opened factories in Grünheide [groon-"EYE"-duh], Germany and near Austin, Texas. At the end of September 2022, this person unveiled an early version of the Optimus artificial intelligence robot. He then made news by carrying a sink. Name this billionaire who is the CEO of both SpaceX and Tesla, and who just fired the CEO of Twitter.

    Answer: Elon (Reeve) <u>Musk</u>

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.

^{TB}21. In one poem by this writer, a boy tells his sister "Don't let him cut my hand off." This poet ended that poem with people turning to their affairs, "since they were not the one dead". In addition to that poem about a buzz saw accident, this poet wrote a work whose last stanza begins "I shall be telling this with a sigh" and ends "And that has made all the difference." This poet began that poem with the line "Two roads diverged in a yellow wood." Another poem by this writer ends with a repetition of the line "And miles to go before I sleep." Name this American poet who wrote "Out, Out", "The Road Not Taken", and "Stopping by Woods on a Snowy Evening".

Answer: Robert (Lee) <u>Frost</u>

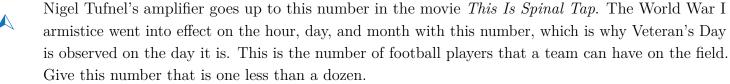*If the score is still tied, continue. If it is not tied, the game is over.*

^{TB}22. These non-biological items can have problematic growths inside them that resemble part of a nerve cell and are called dendrites [DEND-"rights"]. To decrease the problem of leakage, the absorbent glass mat type of these items was developed, which is one of the valve-regulated lead [led]-acid types of these things. In circuit diagrams, these objects are represented as two non-congruent parallel segments. One type of these objects uses nickel oxide hydroxide ["hide-ROCK-side"] and cadmium. Name these providers of electric potential whose strength is measured in volts.

Answer: <u>battery</u>/ies [prompt on electrochemical <u>cell</u>s; accept <u>anode</u>s before "mat"]

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

^{TB}23. If you correct for carrying, powers of this number generate the numbers in the rows of Pascal's triangle. Nigel Tufnel's amplifier goes up to this number in the movie *This Is Spinal Tap*. The World War I armistice went into effect on the hour, day, and month with this number, which is why Veteran's Day is observed on the day it is. This is the number of football players that a team can have on the field. Give this number that is one less than a dozen.

Answer: <u>11</u>

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.