Scobol Solo 2015
Championship III (Phase III: Questions 41-50)

41. This person's son improved an interferometer designed by Ludwig Zehnder. Albert Einstein used this person's name for the principle that inertia is determined by the matter of the universe, which eliminates the concept of absolute space. This person is also the namesake of pressure waves caused by objects traveling at the speed of sound. This person's scientific phenomenalism found in his *The Analysis of Sensations* was further developed by Bertrand Russell and Otto Neurath, influencing logical positivism. Identify this Austrian scientist whose namesake number equals the ratio of the speed of an object to the speed of sound, and is used to specify the speed of fast jets.
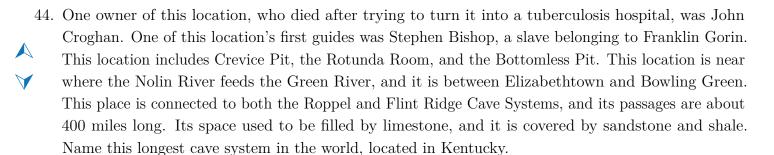
    Answer: Ernst <u>Mach</u>

42. Just before this group was eliminated, its members included Roger Ducos [doo-koh] and Emmanuel-Joseph Sieyès [see-yess], both of whom served in the next government. This group was selected by the Council of Ancients out of a list sent to them by the Council of Five Hundred. An attempt led by Gracchus Babeuf [GRAA-kus bah-boof] to overthrow this group was called the Conspiracy of the Equals. This group's last leader, Louis-Jérôme Gohier [goe-yay], refused to resign after this organization was overthrown in the Coup of 18 Brumaire. Its primary leader was Paul Barras. This group was put in power after the Thermidorian Reaction ended the Committee of Public Safety, and it was ended by Napoleon. Name this government headed by a rotating group of five people.

    Answer: <u>Directory</u> [or <u>Directoire</u>, prompt on <u>French Revolution</u>]

43. In this novel, Edgar complains that Miriam "hasn't got sense even to boil the potatoes", and Miriam later tells her mother that her brothers are brutes. At an earlier meal in this novel, which takes place just before a fair, Annie says "I want to go, I want to go", causing her mother to call her a "whining, wizzening little stick". When the father of the family in this novel cuts his shin trying to close a drawer, he throws the drawer at his wife, cutting her brow. Later in this novel, Annie is treated poorly by Louisa Lily Denys Western, the fiancée of her brother William, who dies of pneumonia. Name this novel about Paul Morel, the son of a coal miner, written by D.H. Lawrence.

    Answer: *<u>Sons and Lovers</u>*

44. One owner of this location, who died after trying to turn it into a tuberculosis hospital, was John Croghan. One of this location's first guides was Stephen Bishop, a slave belonging to Franklin Gorin. This location includes Crevice Pit, the Rotunda Room, and the Bottomless Pit. This location is near where the Nolin River feeds the Green River, and it is between Elizabethtown and Bowling Green. This place is connected to both the Roppel and Flint Ridge Cave Systems, and its passages are about 400 miles long. Its space used to be filled by limestone, and it is covered by sandstone and shale. Name this longest cave system in the world, located in Kentucky.

Answer: <u>Mammoth</u> Cave [accept <u>Mammoth Cave</u> National Park]

45. This composer's only string quartet was written for Joseph Hell·mes·berger. Because Hellmesberger found the scherzo ["SCARE"-tsoh] too difficult, this composer wrote his only inter·mezzo to replace it. Though this composer is not a Strauss, August Silberstein wrote the lyrics for this composer's *Germanenzug [gair-MAHN-en-zoog]* and *Helgo·land*. This composer used five Wagner [VAHG-nur] tubas in his seventh symphony, which was written while Wagner was dying. When this composer's eighth symphony was sent to Hermann Levi, Levi said it was "impossible to perform," leading to a rewrite of what is now nicknamed *The Apocalyptic*. Name this composer whose fourth symphony is nicknamed *Romantic* and who often left behind several versions of his works.

Answer: Anton <u>Bruckner</u>

Check the score.

46. The paradox named for this person is based on a definition of entropy that is not proportional to the amount of substance, meaning that it is non-extensive, and which does not follow the second law of thermodynamics. This person improved Boltzmann's definition of entropy by using probabilities of states, and his work was updated for quantum mechanics by John von Neumann [vawn NOY-mun]. The formula named for this person is applied to systems at constant temperature and pressure to determine how much work they can do. Identify this American scientist, the namesake of a value calculated as "enthalpy minus temperature times entropy", his free energy.

Answer: Josiah Willard <u>Gibbs</u>

47. During a historical flashback in this novel, a character is told "Go up on the rocks yonder, and gather roses." Those roses were arranged by an apparition representing the Virgin Mary to look like herself. Another character in this novel loses everything except his books when his steamer sinks in Gal·vest·on harbor. That character had difficulty reaching his goal because he was traveling at a time when railroad lines ended in Cincinnati. This novel begins with a prologue in Rome, though this novel is based primarily in New Mexico after the Mexican War. Name this novel about Joseph Vaillant and Jean Marie Latour, written by Willa Cather.

Answer: *<u>Death Comes for the Archbishop</u>*

48. When two types of this quantity add to more than one, the Marshall-Lerner condition is met, so devaluations are effective. One form of this quantity was developed based on an assumption in the paper "A Theory of Demand for Products Distinguished by Place of Production" by Paul Armington. The "point" or "arc" type of this quantity is calculated by multiplying a ratio times the derivative of its denominator with respect to its numerator. If this quantity is high, then marginal revenue is positive. A common type of this quantity addresses the change in demand with respect to price. Name this measure of how much one quantity changes based on changes in a different quantity.

Answer: <u>elastic</u>ity [accept more specific answers]

49. This battle stopped the ransacking of a shrine of St. Hilary and the Basilica of St. Martin. Though their leader died in this battle, the losing side later occupied Avignon [ah-veen-yohn] and Arles [arl] from Narbonne. The outcome at this battle reversed the outcome of the earlier Battle of the River Garonne, improving the outlook for Odo the Great of Aquitane. After their leader died the first day, the forces of the Umayyad Caliphate fled during the night. The death of Abdul Rahman helped the Merovingian [mair-oh-VIN-jee-un] Franks and their leader Charles Martel. Name this 8th century battle, also known as the Battle of Poitiers [pwaht-yay], that turned back the Muslim advance into Europe.

Answer: Battle of <u>Tours</u> [accept Battle of <u>Poitiers</u> before it is mentioned]

50. A method to determine membrane fluidity measures this phenomenon after photo·bleaching a membrane, and is called FRAP [fraap]. As with Raman scattering, this effect's spectrum can display a Stokes shift. This phenomenon occurs due to an allowed singlet-to-singlet transition. Microscopes to view this phenomenon commonly use dichroic ["die"-KROH-ik] filters, and are used to visualize cells stained with DAPI [DAAP-ee] or rhodamine [ROH-duh-meen]. The jellyfish *aequorea victoria* [ay-KWOR-ee-uh "victoria"] is the source of a protein which exhibits this phenomenon in the form of green light. Name this phenomenon in which a substance absorbs light and emits it at a lower energy, similar to phosphorescence.

Answer: <u>fluorescence</u> [or <u>fluorescing</u>]

This is the end of the packet.