

The Questions Concerning Technology
By WB
Round 6

1. **This being's servants include Alexander Adell and Bertram Lupov. This character goes by the alias Joe when helping Milton find a potential girlfriend, Charity Jones, but then this character has Milton arrested and plots to make Chastity his own lover. This character refuses to answer Todd Nemerson until Todd says "Please" in the story "Key Item."** This being conducts an interrogation of Norman Muller because Norman was the one person chosen to vote that year. He manipulates Joseph Manners' son Ben in an elaborate plot to commit suicide which takes place in "All the Troubles of the World." This character is killed after Bakst distracts him with the problem of genetically engineering subservient humans. In one story, this being is succeeded by more powerful ACs, the eventual cosmic form of which learns to reverse entropy and then announces "LET THERE BE LIGHT!". For 10 points, name this very powerful computer that appears in many of Isaac Asimov's short stories.

ANSWER: Multivac

2. **In bone scaffold studies, these machines are fed Schelofix mix and MC3T3-E1 cells are added to the output. Two low cost examples of these machines available from the Internet are Wallace and Prusa Mendel. Airbus has an initiative to invent giant versions of these devices by 2050. CO2 lasers are fired on powders in the SLS type of these.** RepRap is a project to produce an open source one. One of these products works through a stepstruder. Shapeways is an online service that allows users to use these machines. A common mechanism in Stratasys's machines of this type is fused deposition of thermoplastics. These devices are increasingly used in rapid prototyping. For 10 points, name these machines that can create physical objects from a computer design, much like how a Canon PIXMA can make hard copies of a tournament.

ANSWER: 3D printers

3. **The public transit station at the base of this structure resembles a toy train. One neighbor of this structure complained that it was "monument to the munificence of the Emirate of Qatar." The mayor of the city where this structure is located claimed it was an illustration of the "determination to beat the recession and spur economic growth." This building is sort of an oblong pyramid and is located where the Southwark Towers used to be. This Renzo Piano building is taller than a tower at Canary Wharf, which used to be the tallest building in this building's city.** For 10 points, name this London skyscraper that is as of July 2012, the tallest building in Western Europe.

ANSWER: The Shard [or London Bridge Tower]

4. **The durability of these tools were greatly improved thanks to Robert Ransome's work in the 18th century. William Seward claimed that "no man has been as inadequately rewarded" as Jethro Wood, who introduced a relatively modern design of this tool. In the Middle Ages, the Mediterranean scratch example of these tools was replaced by a "heavy" one in Germany, thus decreasing the need for the cross usage of these. Thomas Jefferson designed a mouldboard "of least resistance" for use in one of these tools. Common components of these include the coulter and the share. Steel was introduced into the construction of these by John Deere.** For 10 points, name these devices that are used to breakup and turn the soil.

ANSWER: plow

5. **The first algorithm for finding one of these structures for simple inputs in less than $n \log n$ was given by Tarjan and Van Wyk. The Gabriel graph is a subgraph of one special type of these structures. Mirante's method for doing this connects the outer edges in a radial fashion.** A common way to do this is to first perform a monotone decomposition and then find this for the monotone structures in linear time. The solution to the Art Gallery Problem performs a coloring on one of these structures created from the problem description. The Voronoi diagram is the dual for one type of these solutions on a set of points. In the Delaunay type of these structures, no points are located within the circumcircles. For 10 points, name these decompositions of a polygon into maximal non-intersecting diagonals that form certain three sided shapes.

ANSWER: triangulations

6. **Until the 1970s, this company operated the Rocky Flats nuclear weapon production facility. This company brought chlorpyrifos based insecticides to the market under the name Lorbsan. It calls its polyethylene products Carbowax. This company discovered polyvinylidene chloride and subsequently used the compound in its Saran Wrap.** This company was the subject of protests because it was the main supplier of Napalm to the U.S.

Military during the Vietnam War. Its scientist, Ray McIntire, developed styrofoam. In 1999, this company bought the company responsible for the Bhopal disaster, Union Carbide. This company ran an ad campaign about the “element not listed on the chart,” the human element. Its logo is its name in a red diamond. For 10 points, name this large American chemical company that is not DuPont.

ANSWER: **Dow** Chemical

7. **Company name or general service name acceptable. One Tumblr named for and about this website explains that the lack of talk about French poet Théodore de Banville on this site is because of a glitch in its word filter. A BBC news story details how one man used this website to organize a human wall that prevented a truck full of dogs from going down a road. Its first social game is vaguely based on the London Olympics. An orange V graphic is used to denote certified accounts of famous people on this site.** To the question writer, this service's logo looks like a deformed angled eyes with waves of communication coming out of it. On March 16th 2012, this site and several smaller competitors started requiring real names. Ai Wei Wei's account on this service keeps on getting blocked and after the July 2012 Beijing flooding, phrases and words like “Beijing Death Toll” and mayor were blocked from being searched on it. For 10 points, name this Chinese equivalent of Twitter.

ANSWER: **Sina Weibo** [accept either]

8. **In the spring of 2012, Trizone, a new line of these devices, was launched in the UK. The Pocket Doltz is a portable tube shaped one of these machines that is sold in Japan. This device was patented by Phillipe Woog. One of the first commercially available versions of this machine was made by Broxo.** Three top of the line models in the U.S. are the the Vitality, the Triumph, and the Diamondclean. These devices commonly have a timer preset for around two minutes and the ability to change how many pulsations per second occur. For 10 points, name these oral hygiene products that are exemplified by Sonicare.

ANSWER: **Electrical Toothbrush** [prompt on partial answer]

9. **This weapon came in fourth during the 2007 Extreme Dust Test. Weapons that have been proposed to replace this one include the SCAR, SR-16, and CM901. A weightier version of this weapon is the 921HB. The upper receiver of this weapon can be replaced by the Close Quarter Battle Receiver.** The A1 variant of this weapon allows for full automatic operation unlike the standard version which only allows semi-automatic and 3 round burst operation. This weapon is based on a shortened version of the M16A2. For 10 points, name this current standard issue infantry firearm in the U.S. Army.

ANSWER: **M4** carbine [prompt on **M16**]

10. **This action does not involve an ARD, but one plan to do this uses a aluminum honeycomb structure covered with NORCOAT-Liege blocks as a barrier. A common method of doing this uses layers of Vectran to encapsulate a tetrahedron structure.** A successfully way of doing to this uses a combination of RADs and TIRs to control the velocity. Like similar, less frequent actions, this is done by enclosing the cargo in an ablative aeroshell and attaching a parachute. A new approach to doing this is the Sky Crane. This action was not done correctly by the Beagle 2 nor a certain polar lander. For 10 points, name this action which will hopefully be carried out by NASA's *Curiosity* the day of or the day after this tournament.

ANSWER: **landing on mars** [accept equivalents]

11. **One framework named for this man was used to create the Mnesia database. One structure named for this man is the sum of k iid(eye eye d) random variables described by exponential distributions.** When the gamma distribution's shape parameter is limited to positive integer values, this man's distribution results. CouchDB is written in a language named for this man. His loss formula gives the percentage of customers who leave because all the tellers are busy. That loss formula of his is also known as his B formula. His distribution describes the waiting time between event m and event m+k in a Poisson process. This man names the unit of traffic intensity for circuit based telephone networks. For 10 points, name this Danish telephone queuing theory pioneer who is the namesake of a programming language created by Ericsson.

ANSWER: Agner Krarup **Erlang**

12. **In Medieval India, the products of this industry included Kanta and Munda. Businessman John Wilkinson was so obsessed with this industry that he was known as this mad-Wilkinson. Dud Dudley developed the use of a new fuel source in this industry, however his production site was destroyed by the May-Day flood. Richard Crawshay was a promoter of Henry Cort's puddling process in this industry because he thought it would crack open the culture of its workers. Abraham Darby's contribution to this industry allowed it to move away from using charcoal. The Black Country of the West Midlands was so named because of the incredible**

amount of coal used by this industry. This industry makes use of Blast Furnaces. For 10 points, name this industry of manipulating a metal that has wrought and cast forms and whose invention lead to the age following the Bronze Age.

ANSWER: iron industry [antiprompt on steel industry]

13. **Due to a glitch in the way a file of regular expressions was read to filter out inappropriate user-names, the first attempts to sign-up for this service would result in an error message of “fuck.” The company that developed this product initially used the old ruse of claiming to be “studying the results of sleep deprivation, poor diet, and no social life for extended periods of time on humans and dwarf rabbits.” It is not Catapult Entertainment, but one of the founders of the company that made this product would go on to create OnLive.** The company behind this product was founded by , Bruce Leak, and Phil Goldman, and Steve Perlman. This product served as the basis of Dishplayer. This product got rebranded to a “MSN” property after being bought out by Microsoft. It came with both a keyboard and a remote. For 10 points, name this 90s product that brought the Internet to a living room appliance.

ANSWER: WebTV [prompt on MSNtv]

14. **Mark A. Bedau edits a journal dedicated to these entities. Thomas Ray's Tierra project was an effort to create these entities. One program for studying the long term behavior of these entities is Chris Adami's Avida.** Steen Rasmussen was inspired by Core Wars to create a primitive one of these entities. Langton coined this term and proposed that they should be created using cellular automata. Markus Covert's recently published work on *Mycoplasma genitalium* almost constitutes one of these. For 10 points, name these organisms that are not natural.

ANSWER: artificial life [or virtual organisms; or digital organisms; accept equivalents]

15. **The company Ovonyx primarily deals with this technology. Its linear current at low voltages and exponential relationship at high voltages is modeled by a Poole-Frankel transport through traps and at certain field strengths a negative differential resistance occurs. An optical technology that shares the central conceptual underpinning of this technology uses materials along the GeTe–Sb₂Te₃ pseudobinary line.** This technology is based on chalcogenides and their electronic threshold switching effect. This technology is byte addressable and is more reliable than Flash. For 10 points, name this computer storage technology that uses the different resistivities that come from amorphous and poly-crystalline states.

ANSWER: phase change memory [or PCM]

16. **Alain Deutsch created one program for doing this action in response to the first launch of the Ariane 5. One Microsoft tool for doing this action is Prefix while another vendor sells the Polyspace program for doing this. One family of programs for doing this are based on Lint.** Coverity's “Scan” initiative performs this action for open source projects. Two problems within this approach, May Alias and Must Alias, are undecidable while this technique in its most general form is undecidable because of the halting problem. Programs that do this attempt to find code that could possibly, but not necessarily, attempt a null deference or to divide by zero. The FindBugs program does this for Java code. For 10 points, name this approach to the debugging and study of a program by looking at the code but not executing it.

ANSWER: static analysis [prompt on debugging; prompt on code analysis]

17. **One of this man's creations contains Cupid on a silver balcony with a bird on his wrist along with a girl whose actions include taking a pinch of snuff and performing to the beat of the music. His work *Grotto* is now lost. Another of this man's creations can output works such as “My Pooch” and a portrait of Louis XV. The King of Spain once asked one of his works what time it was without reply prompting this man to say that the device did not yet know Spanish. The National Palace of Madrid contains his Shepherd's Clock. This man is one of the more probable candidates for being the inventor of the wristwatch. The work for which he is probably best known is a family consisting of the Musician, Draughtsman, and Scribe. For 15 points, name this 18th century Swiss maker of watches and automata.**

ANSWER: Pierre Jaquet-Droz

18. **This work connects the discussion of ordinance and scholarly learning in “Gargantua's Letter to Pantragrue!” with the “citizen armies of Cromwell and Napoleon.” It claims that Peter Ramus surfed the wave of the title concept and that Heidegger “surf boards” along a newer mechanism.** This work discusses the two bodies of kings in a section titled “Medieval Idols of the King.” It begins by investigating the “darker purpose” of King Lear and society's transition from roles to jobs. This work is organized by the “field approach”, resembling a mosaic. It considers changes in the ratio between the senses, particularly how one invention lead to centering of

civilization around the visual. For 10 points, name this work on the effect of the printing press on Western Civilization, written by Marshall McLuhan.

ANSWER: The **Gutenberg Galaxy**: The Making of Typographic Man

19. **The second to last major installment in this series came with a dancing version of the star of *Oddworld: Munch's Oddysee*. The first version included a dialup server and support for anti-aliased fonts. One version included a game that would later be included in a related product and that game includes the words "cinematronics" and "maxis" in its interface. A kids version of this product included *Play It, Protect It, Paint It, and Talk It*.** Over the years the included such diversions as a trial of Lose Your Marbles, Pandora's Box, Russian Square, Labyrinth, and Hyperbowl. Multimedia features included a CD label maker, voice controls for playing back media files, and a personal DJ. One of its games gives you bonus points for hitting a wormhole with your ball. In addition to the *Space Cadet* pinball game, it came with extra wallpaper and screensavers. Components of this product had an annoying habit of ending their name with an exclamation point. This product line would be superseded by "Ultimate Extras." For 10 points, name this add-on pack for Windows.

ANSWER: **Microsoft Plus!** [do not accept **Windows Plus!**]

20. **The forerunner of this technology was Sam Hurst's Elograph. This technology can be implemented by using insulating separator dots to keep layers apart. This was the most notable feature of the HP-150. One of the most common approaches to making one of these uses four appropriately placed oscillators to measure changes in electrical frequency across indium tin oxide caused by** conductive objects. The Adobe Ideas program is intended to be used with this technology. A large one of these is found at the top of Microsoft PixelSense products. These can be resistive or capacitive. These devices allow the underlying computer to understand gestures like pinch to zoom. For 10 points, name these displays that respond to tactile input.

ANSWER: **touch**screen

Tiebreaker:

By using a one certain long string in this programming language, an easter egg picture of dogs and rabbits will appear. eAccelerator is an optimizer and bytecode cache for this language. One now gone feature in this programming language is magic quotes. This language is implemented by the Zend Engine. Programs in this language begin with less than question mark this language's name. For 10 points, name this programming language in which the HSQB forum is written.

ANSWER: **PHP**