

CSPB 3702 - Reckwerdt - Cognitive Science

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Started on Wednesday, 30 August 2023, 7:15 PM

State Finished

Completed on Wednesday, 30 August 2023, 7:32 PM

Time taken 17 mins 17 secs

Question **1**

Correct

Marked out of 1.00

Look at the automata exhibited by the Cabaret Mechanical Theatre: <https://cabaret.co.uk/>

Which of the following predecessors, do you think, is closest to the tradition in which these modern artists are working?

Select one:

- ☒ a. Jacques de Vaucanson
- ☐ b. Eli Whitney
- ☐ c. Rene Descartes
- ☐ d. Gustave Eiffel



Your answer is correct.

Question **2**

Correct

Marked out of 1.00

Doing some Web research, you should find that one of the following artists did astonishing (and now vanished) work in the creation of automata. Which of these artists was an automaton-builder?

Select one:

- ☐ a. Michelangelo
- ☒ b. Leonardo da Vinci
- ☐ c. Albrecht Dürer
- ☐ d. Raphael



Your answer is correct.

Question **3**

Correct

Marked out of 1.00

Self-driving cars are a particularly active (and controversial) area of current AI research. Among the following responses to the Turing test, which is most relevant (think of it as an obstacle to overcome) in creating self-driving cars?

Select one:

- ☐ a. The "heads in the sand" objection
- ☐ b. The theological objection
- ☐ c. The argument from ESP
- ☒ d. the argument from informality of behavior



Your answer is correct.

Question **4**

Correct

Marked out of 1.00

Which of the following medieval technologies was most influential in prompting people to think about similarities between living things and machines?

Select one:

- ☐ a. Gunpowder
- ☐ b. Water-powered mills
- ☒ c. Clocks
- ☐ d. Harbor cranes



Your answer is correct.

Question **5**

Correct

Marked out of 1.00

The perceived parallels between machines and people inspire different emotional themes in literature. Which of the following themes is *least* prominent in this literature?

Select one:

- ☒ a. Military glory
- ☐ b. Wonder
- ☐ c. Terror
- ☐ d. Humor



Your answer is correct.

Question 6

Correct

Marked out of 1.00

Which of the following arguments follows (according to Searle) from John Searle's "Chinese Room" thought experiment?

Select one:

- ☐ a. Only evolution can produce intelligence, and since computer programs are not the result of an evolutionary process, they cannot be intelligent.
- ☐ b. Arguably, animals (e.g., dogs and chimpanzees) are intelligent. Since they could not pass the Turing test, that test cannot be an adequate measure of intelligence.
- ☐ c. Intelligence can only be explained by appeal to immaterial qualities that transcend scientific understanding.
- ☒ d. Even if a computer *did* "pass" the Turing Test, this would not mean that the computer was exhibiting anything like human intelligence because of its lack of intentionality. ✓

Your answer is correct.

Question 7

Correct

Marked out of 1.00

Which of the following best summarizes Searle's response to the "Robot Reply"?

Select one:

- ☐ a. Robots could never pass the Turing test unless they physically resembled humans very closely.
- ☒ b. You could incorporate sensors and actuators (like the input from TV cameras, and motors to control arms and legs) into the Chinese characters that are used to communicate with the room. ✓
- ☐ c. Trying to build a robot to pass the Turing test is even harder than trying to program a computer to pass the Turing test.
- ☐ d. The sorts of sensors that robots might use (cameras, touch sensors, microphones, etc.) are not especially helpful to the realization of intelligence.

Your answer is correct.

Question 8

Correct

Marked out of 1.00

Jacques de Vaucanson drew parallels between machines and living beings mainly for the purpose of:

Select one:

- ☐ a. Religious enlightenment
- ☐ b. Advancing the philosophy of mind
- ☐ c. Studying the nature of the animal world
- ☒ d. Entertainment and display



Your answer is correct.

Question 9

Correct

Marked out of 1.00

De la Mettrie's ideas about mechanical interpretations of the human animal are part of a larger movement in scientific history. Which of these thinkers do you think is most representative of the tradition in which de la Mettrie was working?

Select one:

- ☐ a. Paracelsus, who linked astrological ideas and various mineral treatments to medicine.
- ☐ b. Pierre de Fermat, who made fundamental advances in mathematical number theory and optics
- ☐ c. Galileo, who emphasized the link between pure mathematics and physical experiment.
- ☒ d. Newton, who visualized the solar system as a sort of "celestial clockwork"



Your answer is correct.

Question **10**

Correct

Marked out of 1.00

Which of the following is the best summary of “Lady Lovelace’s Objection” as discussed by Turing?

Select one:

- ☐ a. Computers, being unemotional, could never successfully imitate people.
- ☐ b. The problem of understanding the human mind is beyond the capacity of human beings.
- ☒ c. Computers can only do what their programs (and thus their programmers) tell them to do; thus they are incapable of original thinking. ✓
- ☐ d. Computers are digital instruments, and living beings function on the basis of continuous (not digital) quantities, such as chemical gradients at the membranes of neurons. Thus computers could never imitate human beings.

Your answer is correct.

Question **11**

Correct

Marked out of 1.00

Which of the following tasks did Turing mention as a promising beginning candidate for exploring (what would come to be called) artificial intelligence?

Select one:

- ☐ a. Automotive repair
- ☒ b. Chess ✓
- ☐ c. Painting
- ☐ d. Understanding humor

Your answer is correct.

Question **12**

Correct

Marked out of 1.00

Which of the following are early examples of machines imitating man?

Select one or more:

- ☒ a.
Golden maidens of the Iliad ✓
- ☐ b.
Babbage's analytical machine
- ☒ c.
15th century clocks ✓
- ☒ d.
The statues of Hero of Alexandria ✓

Your answer is correct.

Question **13**

Correct

Marked out of 1.00

According to the videos which is the best answer to "What is the foundation of cognitive science?"

- ☐ a. Why humans act the way they do
- ☐ b. The weaving together of man and machines
- ☐ c. Computers and machines imitating human intelligence
- ☒ d. Humans being modeled adequately by machines ✓

Your answer is correct.

Question 14

Correct

Marked out of 1.00

People often have anxiety around machines that imitate humans. The term “uncanny valley” refers to this dip in the emotional response people have to seeing machines that are life-like and resemble people, but are not quite human. What is NOT an example of this?

- ☐ a. Čapek's robots in R.U.R.
- ☐ b. A ventriloquist doll
- ☐ c. The Sandman by E.T.A. Hoffmann
- ☒ d. Hero of Alexandria's statue



Your answer is correct.

Question 15

Correct

Marked out of 1.00

Which of the following are true statements?

Select one or more:

- ☐ a.
AI machines are now capable of passing a Turing Test.
- ☒ b.
We don't know if the Turing Test can ever be passed by machines. ✓
- ☐ c.
We know that machines cannot pass the Turing Test, but we don't know the reason for it.
- ☒ d.
We don't know why the Turing Test hasn't been passed. ✓

Your answer is correct.

Question 16

Correct

Marked out of 1.00

Before William Harvey promoted the analogy that the heart is like a pump, most physicians followed the classical analogy (due to Galen). Using the Web a source of research, answer: which of the following does not characterize Galen's model of the heart?

Select one:

- ☐ a. The heart has two major chambers (not four, as we know today).
- ☐ b. The heart is a source of internal heat in the body.
- ☒ c. The heart is soft tissue.
- ☐ d. The heart's purpose is purification of blood.



Your answer is correct.

Question 17

Correct

Marked out of 1.00

The idea of functionalism holds a certain natural appeal for computer scientists. Which of these statements comes closest to explaining why that's the case?

Select one:

- ☐ a. Functionalism emerged as a philosophical idea around the same time as the computer emerged historically as a working device.
- ☐ b. Functionalist philosophers are generally people who have been professional computer programmers.
- ☒ c. Just as we can study algorithms without worrying about the fine structure of the computers on which they run, we can study cognitive models independent of the physical substrate (neural or mechanical) on which they run.
- ☐ d. Computer scientists find it difficult to model the complexity of the living, physical brain.



Your answer is correct.

Question 18

Correct

Marked out of 1.00

If software is to hardware as mind is to brain, then that implies

Select one:

- ☐ a. Mental models can only be run on computers, not in human or animal brains.
- ☐ b. Studying the mind and brain independently is impossible.
- ☐ c. We can't understand the mind without first understanding the brain.
- ☒ d. Studying neuroscience is analogous to studying computer architecture – interesting, perhaps, but not necessary to the understanding of algorithms.



Your answer is correct.

Question 19

Correct

Marked out of 1.00

Which of the following analogies has not played an important role in the history of science?

Select one:

- ☒ a. Cells are like corporate organizations.
- ☐ b. The solar system is like a clockwork.
- ☐ c. The structure of the atom is like that of the solar system.
- ☐ d. The heart is like a pump.



Your answer is correct.

Question **20**

Correct

Marked out of 1.00

Scientific analogies, in general, are not exact (nor are they supposed to be). Which of these observations does *not* reveal a flaw in a common scientific analogy?

Select one:

- ☒ a. If the solar system is like a clockwork, then we should be able to tell time by the movement of the sun, moon, and planets in the sky. ✔ We *do* tell time this way, at least sometimes!
- ☐ b. If the atom is structured like the solar system, it isn't clear why electrons are only found in discrete "shells" around the nucleus, rather than at any radius whatever.
- ☐ c. If the solar system is like a clockwork, it's not clear why it doesn't "run down" the way clocks do.
- ☐ d. Water running through pipes is a pretty good analogy for Ohm's Law ($V=IR$), but it doesn't provide any understanding of elements like capacitors or inductors.

Your answer is correct.

Question **21**

Correct

Marked out of 1.00

Which of the following is not a usual tenet of functionalism?

Select one:

- ☐ a. We can study models of thinking independent (more or less) of our ideas about how the brain works, since the same models can be implemented on all sorts of physical "machinery", including brains and computers.
- ☐ b. The essence of thinking derives from the (complex) interwoven structure of algorithmic elements that comprise the programmatic description of mind.
- ☒ c. Thinking can take place only in human or animal brains. ✔
- ☐ d. Mind is to brain as software is to hardware.

Your answer is correct.

Question **22**

Correct

Marked out of 1.00

What is a fundamental metaphor in cognitive science?

- ☐ a. The mind is like a toolbox
- ☐ b. The mind works as a perpetual motion machine
- ☒ c. The human mind or animal minds can be modeled by a digital computer ✓
- ☐ d. The mind acts like a solar system

Your answer is correct.

Question **23**

Correct

Marked out of 1.00

If we accept the computational metaphor of the mind, what conclusions can be drawn?

Select one or more:

- ☐ a. Computer scientists will have to study the brain in great detail
- ☒ b. Software is to hardware as mind is to brain ✓
- ☒ c. Mental representations are as real and as worthy of study as algorithms in the realm of computer science ✓
- ☒ d. We don't have to explain the mind at the level of neuroscience ✓

Your answer is correct.

Question **24**

Complete

Marked out of 1.00

Write a brief (~300 words) response to John Searle's "Chinese Room" thought experiment, selecting one of the objections mentioned in Searle's paper and explaining why you think the objection, or Searle's response, is particularly effective.

In John's Searle's "Chinese Room" thought experiment, he creates a hypothesis that the person in the room doesn't necessarily understand Chinese, rather the person only knows how to manipulate Chinese characters for them to make logical sense. I think this objection is rather effective because it can explain why some forms of Artificial Intelligence are better than others when it comes to create responses.

If you take for instance the Chatbot Eliza, Eliza is good in the sense that it can create responses with English words but it is very Evident that Eliza is not good at creating accurate responses to what is presented to it. In the same way that a person in this Chinese thought experiment may be able to actually manipulate Chinese characters to make sense, they may not actually be able to speak Chinese.

This is an effective objection because this person is attempting to imitate someone else who knows Chinese. A person who is capable of speaking Chinese will of course know how to speak it as well as they will know how to manipulate the characters like the person in the thought experiment. The person in the thought experiment is only really capable of manipulating characters, not speaking Chinese.

This can potentially be expanded to other ideas like teaching someone how to do math. You can teach someone arithmetic with numbers, and they can understand what addition, subtraction, etc mean, but what happens when you throw in algebraic expressions? At this point, I would hypothesize that this persons understanding of math would break down and they wouldn't really understand math the way that they think they do.

Question **25**

Complete

Marked out of 1.00

Write a brief (~300 words) response to the Turing paper selecting one of the objections mentioned in the paper and explaining why you think that objection either is or is not particularly provocative.

In the Turing paper, Alan Turing posits that human consciousness is really a gray area of understanding. I don't find this particular objection to be provocative because it is fairly accurate that human consciousness is something that is hard to understand.

Turing also dives in to what it would mean for a machine to be capable of thinking. In this discussion, he critiques the idea of what it actually means to think. Instead, he argues that a machine that can emulate human like thinking would be a machine that could potentially pass the Turing test.

I find the above to be rather provocative because I believe a machine is able to think, but it can think in ways that humans don't. If we define thinking to be that of what humans do, then can animals think? In short, I believe that animals think but they think in different ways than humans. When humans become emotional, we still think, but not as effectively. If an animal finds itself in danger, they become somewhat emotional, but they are still going to think about how they can remove themselves from a dangerous situation.

In the context of what it actually means to think, we have to constantly redefine what that term means for what it is that we are talking about. When talking about machines, they are thinking but they are thinking off of predefined notions and instructions for given scenarios. When AI is thrown into the mix, we then have to try to understand what a model should do if it runs into a road block. This is why I think this objection is provocative, because it is rather subjective and points can be argued on either side.