

## **CHAPTER 15: IS ARTIFICIAL INTELLIGENCE REAL?**

### **Multiple Choice:**

1. During World War II, \_\_\_\_\_ used Colossus, an electronic digital computer to crack German military codes.
- A. Alan Kay
  - B. Grace Murray Hopper
  - C. Alan Turing
  - D. Tim Berners-Lee

**Answer:** C     **Reference:** Alan Turing Military Intelligence, and Intelligent Machines     **Difficulty:** Challenging

2. The British mathematician, \_\_\_\_\_ spent much of his life trying to answer the central question of artificial intelligence “Can machines think?”
- A. Alan Turing
  - B. Alan Kay
  - C. Tim Berners-Lee
  - D. Grace Murray Hopper

**Answer:** A     **Reference:** Alan Turing Military Intelligence, and Intelligent Machines  
**Difficulty:** Challenging

3. Problems with the simulation approach to AI include all of the following EXCEPT:
- A. people don't always know how they do things.
  - B. the brain can perform parallel processing, which is difficult for computers.
  - C. machines operate differently than the brain.
  - D. machines cannot remember hundreds of numbers at the same time.

**Answer:** D     **Reference:** What is Artificial Intelligence?     **Difficulty:** Moderate

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4. In the 1950s, the popular domain for AI research was:

- A. checkers and chess.
- B. solitaire.
- C. OCR.
- D. robotics.

**Answer:** A     **Reference:** What is Artificial Intelligence?

**Difficulty:** Moderate

5. Traditional AI techniques include all of the following EXCEPT:

- A. searching.
- B. heuristics.
- C. pattern recognition.
- D. batch processing.

**Answer:** D     **Reference:** Opening Games

**Difficulty:** Challenging

6. Machine learning involves:

- A. learning from a successful move.
- B. entering the knowledge of a human into a computer.
- C. loading numerous educational programs.
- D. making mistakes so the computer can learn from them.

**Answer:** A     **Reference:** Opening Games

**Difficulty:** Moderate

7. The main outcome of the early automatic language translation efforts was the realization that:

- A. translation without understanding is impossible.
- B. computers are faster and more accurate.
- C. computers make fewer errors than humans.
- D. computers can accurately translate 99% of the text.

**Answer:** A     **Reference:** Machine Translation Traps

**Difficulty:** Moderate

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8. The Babel Fish program is a(n):
- A. language translation program.
  - B. DBMS for marine biology.
  - C. AI search engine.
  - D. Turing test.

**Answer:** A     **Reference:** Machine Translation Traps

**Difficulty:** Moderate

9. A typical problem for machine translation is:
- A. tone inflection.
  - B. the limited vocabulary of natural language.
  - C. the use of accents.
  - D. the amount of knowledge required to understand the meaning of words.

**Answer:** D     **Reference:** Machine Translation Traps

**Difficulty:** Moderate

10. Syntax of a programming language is the:
- A. tone inflection of human language.
  - B. natural accent of a human voice.
  - C. underlying meaning of words.
  - D. set of rules for constructing sentences from words.

**Answer:** D     **Reference:** Nonsense and Common Sense

**Difficulty:** Moderate

11. Semantics, a problem with natural-language communication, refers to the:
- A. underlying meaning of words and phrases.
  - B. set of rules used to construct sentences from words.
  - C. natural accent of the human voice.
  - D. tone inflection of human speech.

**Answer:** A     **Reference:** Nonsense and Common Sense

**Difficulty:** Moderate

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12. The most successful natural-language applications:

- A. involve computers having meaningful conversations with humans.
- B. use narrow, carefully defined domains.
- C. keep rules very flexible and variable.
- D. ignore the need for common sense.

**Answer:** B      **Reference:** Nonsense and Common Sense

**Difficulty:** Easy

13. A typical knowledge base contains:

- A. knowledge of generalists.
- B. only rules.
- C. common sense from common people.
- D. both facts and a system of rules.

**Answer:** D      **Reference:** Knowledge Bases

**Difficulty:** Easy

14. A knowledge base contains:

- A. rules, facts, and relationships.
- B. only rules and relationships.
- C. simulation of human thinking.
- D. only facts.

**Answer:** A      **Reference:** Knowledge Bases

**Difficulty:** Moderate

15. A software program designed to replicate the decision-making process of a human expert is a(n):

- A. data network system.
- B. replication database.
- C. expert system.
- D. semantic system.

**Answer:** C      **Reference:** Artificial Experts

**Difficulty:** Easy

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16. A(n) \_\_\_\_\_ could be used to replicate how a specialist diagnoses lung cancer.

- A. expert system
- B. MIS
- C. TPS
- D. micromachine

**Answer:** A      **Reference:** Artificial Experts

**Difficulty:** Easy

17. When a conclusion is stated as a probability rather than an exact fact, it is known as:

- A. an expert system.
- B. statistical logic.
- C. fuzzy logic.
- D. a pattern recognition system.

**Answer:** C      **Reference:** Artificial Experts

**Difficulty:** Moderate

18. The term, \_\_\_\_\_ describes the use of a system to give a conclusion along with its probability of happening:

- A. fuzzy logic
- B. neural network
- C. image analysis
- D. parsing

**Answer:** A      **Reference:** Artificial Experts

**Difficulty:** Easy

19. MYCIN, XCON and AARON are all examples of:

- A. expert systems.
- B. expert system shells.
- C. fuzzy logic.
- D. robots.

**Answer:** A      **Reference:** Expert Systems in Action

**Difficulty:** Challenging

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20. Even though they weren't accepted with enthusiasm, successful expert systems were first developed in the field of:
- A. insurance.
  - B. medicine.
  - C. aviation.
  - D. geology.

**Answer:** B      **Reference:** Expert Systems in Action      **Difficulty:** Easy

21. To facilitate development of new expert systems, software companies sell:
- A. knowledge bases.
  - B. ELIZA.
  - C. parsers.
  - D. expert system shells.

**Answer:** D      **Reference:** Expert Systems in Perspective      **Difficulty:** Easy

22. The following are all examples of pattern recognition EXCEPT:
- A. systems analysis.
  - B. surveillance satellite data analysis.
  - C. biological slide analysis.
  - D. handwriting recognition.

**Answer:** A      **Reference:** Pattern Recognition: Making Sense of the World      **Difficulty:** Easy

23. The field of AI called \_\_\_\_\_ includes fingerprint identification, handwriting recognition, and weather forecasting.
- A. pattern recognition
  - B. OCR
  - C. parsing programs
  - D. fuzzy logic

**Answer:** A      **Reference:** Pattern Recognition: Making Sense of the World      **Difficulty:** Moderate

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24. Identifying recurring arrangements in input data and eventually understanding or categorizing that input is known as:
- A. fuzzy logic.
  - B. automatic translation.
  - C. parsing.
  - D. pattern recognition.

**Answer:** D     **Reference:** Pattern Recognition: Making Sense of the World     **Difficulty:** Moderate

25. \_\_\_\_\_ is the process of identifying objects and shapes in a photograph, drawing, video, or other visual images.
- A. ELIZA
  - B. Image analysis
  - C. OCR
  - D. Fuzzy logic

**Answer:** B     **Reference:** Pattern Recognition: Making Sense of the World     **Difficulty:** Easy

26. OCR stands for:
- A. original character representation.
  - B. optical character recognition.
  - C. optical computer reply.
  - D. original character recognition.

**Answer:** B     **Reference:** Optical Character Recognition     **Difficulty:** Easy

27. Advanced speech recognition programs that are \_\_\_\_\_ have the ability to recognize speech without being trained by a speaker.
- A. OCR systems
  - B. speaker independent
  - C. digitized speech
  - D. synthetic speech systems

**Answer:** B     **Reference:** Automatic Speech Recognition     **Difficulty:** Moderate

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28. When a computer's speech sounds like that of a person, it is using:

- A. OCR technology.
- B. synthetic language.
- C. speech synthesis.
- D. heuristics.

**Answer:** C      **Reference:** Talking Computers

**Difficulty:** Moderate

29. A network of many distributed, parallel computing systems is called a \_\_\_\_\_ network.

- A. neural
- B. cerebral
- C. rational
- D. robot

**Answer:** A      **Reference:** Neural Networks

**Difficulty:** Moderate

30. An example of a \_\_\_\_\_ network is software used by American Express to read and analyze millions of charge slips each day.

- A. neural
- B. cerebral
- C. rational
- D. robotic

**Answer:** A      **Reference:** Neural Networks

**Difficulty:** Moderate

31. For a \_\_\_\_\_ network to learn to recognize a pattern, it goes through many trials, weakening the circuit pattern for incorrect guesses and strengthening circuit patterns for correct guesses.

- A. cerebral
- B. rational
- C. neural
- D. robotic

**Answer:** C      **Reference:** Neural Networks

**Difficulty:** Easy



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32. With respect to neural networks, all of the following are true EXCEPT:

- A. neural networks distribute knowledge throughout the network.
- B. neural networks store information in the same way as traditional computers.
- C. neural networks use distributed, parallel computing systems.
- D. neural networks continue to function even if some of its neurons are destroyed.

**Answer:** B      **Reference:** Neural Networks

**Difficulty:** Moderate

33. A(n) \_\_\_\_\_ is a machine controlled by a computer and designed to perform specific manual tasks.

- A. speech synthesizer
- B. expert system
- C. robot
- D. parser

**Answer:** C      **Reference:** What is a Robot?

**Difficulty:** Easy

34. A sensor is an example of a(n) \_\_\_\_\_ device for a robot.

- A. output
- B. input
- C. storage
- D. memory

**Answer:** B      **Reference:** What is a Robot?

**Difficulty:** Easy

35. Robots are effective for all of the following activities EXCEPT:

- A. cleaning up hazardous waste.
- B. doing repetitive jobs.
- C. working 24/7.
- D. calculating pay for thousands of employees.

**Answer:** D      **Reference:** Steel-Collar Workers

**Difficulty:** Moderate

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36. \_\_\_\_\_, a simulator, is considered the beginning of the age of automated therapy.

- A. ELIZA
- B. XCON
- C. OCR
- D. AARON

**Answer:** A     **Reference:** AI Implications and Ethical Questions     **Difficulty:** Challenging

37. The manufacture of machines on a scale of a few billionths of a meter is referred to as:

- A. pentatechnology.
- B. microtechnology.
- C. nanotechnology.
- D. macrotechnology.

**Answer:** C     **Reference:** Inventing the Future: Microtechnology and Nanotechnology  
**Difficulty:** Challenging

38. Research in \_\_\_\_\_ systems is concerned with miniaturization of computers using microscopic parts.

- A. macroelectromechanical
- B. ELIZA
- C. microelectromechanical
- D. silicon chip

**Answer:** C     **Reference:** Inventing the Future: Microtechnology and Nanotechnology  
**Difficulty:** Challenging

**Fill in the Blank:**

39. AI stands for \_\_\_\_\_.

**Answer:** artificial intelligence     **Reference:** Alan Turing, Military Intelligence, and Intelligent Machines  
**Difficulty:** Easy

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40. In the classic \_\_\_\_\_ test, a computer is considered to be intelligent if it can successfully pose as a human being when replying to questions.

**Answer:** Turing                      **Reference:** Can Machines Think?                      **Difficulty:** Moderate

41. \_\_\_\_\_ processing is the process of breaking complex jobs into manageable pieces and completing all of these tasks at the same time.

**Answer:** Parallel                      **Reference:** What is Artificial Intelligence?                      **Difficulty:** Moderate

42. A(n) \_\_\_\_\_ is a rule of thumb.

**Answer:** heuristic                      **Reference:** Opening Games                      **Difficulty:** Challenging

43. The AI technique called \_\_\_\_\_ is the process of looking at possibilities and choosing one that has the best chance of being successful.

**Answer:** searching                      **Reference:** Opening Games                      **Difficulty:** Moderate

44. Early work in AI focused on games like \_\_\_\_\_.

**Answer:** checkers and chess                      **Reference:** Opening Games                      **Difficulty:** Easy

45. In 1997, IBM's \_\_\_\_\_, a customized RS/6000 SP computer, beat Garry Kasparov, a chess grand master.

**Answer:** Deep Blue                      **Reference:** Opening Games                      **Difficulty:** Challenging

46. The \_\_\_\_\_ technique rapidly repeats a simple operation until an answer is found.

**Answer:** brute-force                      **Reference:** Opening Games                      **Difficulty:** Challenging

47. Every natural language has a(n) \_\_\_\_\_, a set of rules for constructing sentences from words.

**Answer:** syntax                      **Reference:** Nonsense and Common Sense                      **Difficulty:** Moderate

48. The most successful natural-language applications limit their \_\_\_\_\_, or affected area, so that rules can be clean and unambiguous.

**Answer:** domain                      **Reference:** Nonsense and Common Sense                      **Difficulty:** Easy

49. A(n) \_\_\_\_\_ program analyzes sentence structure and identifies parts of speech.

**Answer:** parsing                      **Reference:** Machine Translation Traps                      **Difficulty:** Moderate

50. Between humans and computers, \_\_\_\_\_ are better at comprehending and identifying relationships among facts.

**Answer:** humans                      **Reference:** Knowledge Bases and Expert Systems                      **Difficulty:** Easy

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51. \_\_\_\_\_ is information that incorporates the relationships among facts.

**Answer:** Knowledge                      **Reference:** Knowledge Bases and Expert Systems                      **Difficulty:** Easy

52. A database contains only facts, while a(n) \_\_\_\_\_ base also contains a system of rules for determining and changing relationships among those facts.

**Answer:** knowledge                      **Reference:** Knowledge Bases                      **Difficulty:** Challenging

53. A(n) \_\_\_\_\_ is a person with an extraordinary amount of knowledge within a narrow domain.

**Answer:** expert                      **Reference:** Artificial Experts                      **Difficulty:** Easy

54. A(n) \_\_\_\_\_ system is a software program designed to replicate the decision-making process of a human specialist.

**Answer:** expert                      **Reference:** Artificial Experts                      **Difficulty:** Moderate

55. Because most human decision making involves ambiguity, \_\_\_\_\_ logic allows for conclusions that are based on probabilities rather than certainties.

**Answer:** fuzzy                      **Reference:** Artificial Experts                      **Difficulty:** Moderate

56. An expert system is designed to replicate the decision-making process of a human \_\_\_\_\_.

**Answer:** expert                      **Reference:** Artificial Experts                      **Difficulty:** Easy

57. \_\_\_\_\_ was a successful expert system developed by Digital Equipment Corporation to configure, maintain, and troubleshoot computer systems.

**Answer:** XCON                      **Reference:** Expert Systems in Action                      **Difficulty:** Challenging

58. \_\_\_\_\_ is an expert system that produces drawings of people, plants, and objects based on rules of human anatomy and behavior.

**Answer:** AARON                      **Reference:** Expert Systems in Action                      **Difficulty:** Challenging

59. Because \_\_\_\_\_ information is orderly and well-documented, MYCIN became one of the first successful expert systems.

**Answer:** medical                      **Reference:** Expert Systems in Action                      **Difficulty:** Moderate

60. An expert system \_\_\_\_\_ is used to develop an expert system using human interfaces and inference engines.

**Answer:** shell                      **Reference:** Expert Systems in Perspective                      **Difficulty:** Moderate

61. Expert systems use \_\_\_\_\_ recognition to acquire knowledge about the world.

**Answer:** pattern                      **Reference:** Pattern Recognition: Making Sense of the World  
**Difficulty:** Moderate

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62. The process of \_\_\_\_\_ analysis is used for recognizing and recoloring classic motion pictures or piloting cruise missiles.

**Answer:** image                      **Reference:** Image Analysis                      **Difficulty:** Challenging

63. Voice recognition systems that are \_\_\_\_\_ independent have the ability to recognize speech without being trained by the person talking.

**Answer:** speaker                      **Reference:** Automatic Speech Recognition                      **Difficulty:** Moderate

64. Most modern robots include \_\_\_\_\_ that accept new input enabling robots to correct or modify their actions based on feedback from the outside world.

**Answer:** sensors                      **Reference:** What is a Robot?                      **Difficulty:** Challenging

65. \_\_\_\_\_ speech is the playing of prerecorded speech stored on a computer.

**Answer:** Digitized                      **Reference:** Talking Computers                      **Difficulty:** Moderate

66. Speech \_\_\_\_\_ allows a computer to recite anything you can type.

**Answer:** synthesis                      **Reference:** Talking Computers                      **Difficulty:** Moderate

67. With \_\_\_\_\_ software or hardware, PCs recite typed text using robotic voices.

**Answer:** speech synthesis                      **Reference:** Talking Computers                      **Difficulty:** Moderate

68. A(n) \_\_\_\_\_ network is comprised of a few thousand simple processors working simultaneously.

**Answer:** neural                      **Reference:** Neural Networks                      **Difficulty:** Challenging

69. A(n) \_\_\_\_\_ is a computer-controlled machine designed to perform specific manual tasks.

**Answer:** robot                      **Reference:** What Is a Robot?                      **Difficulty:** Moderate

70. In factories, boring, dirty, or dangerous tasks are often done by \_\_\_\_\_ that use AI software.

**Answer:** robots                      **Reference:** Steel-Collar Workers                      **Difficulty:** Moderate

71. \_\_\_\_\_ intelligence is the application of AI concepts to networks rather than individual computers.

**Answer:** Distributed                      **Reference:** AI Implications and Ethical Questions                      **Difficulty:** Moderate

72. Microtechnology carried to its extreme is called \_\_\_\_\_, which is the manufacture of machines on a scale of a few billionths of a meter.

**Answer:** nanotechnology                      **Reference:** Inventing the Future: Microtechnology and Nanotechnology  
**Difficulty:** Challenging

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73. Machines on the scale of a millionth of a meter are called \_\_\_\_\_.

**Answer:** micromachines

**Reference:** Inventing the Future: Microtechnology and Nanotechnology

**Difficulty:** Moderate

74. \_\_\_\_\_ computers are based on the properties of atoms and their nuclei and the laws of quantum mechanics.

**Answer:** Quantum

**Reference:** Inventing the Future: Microtechnology and Nanotechnology

**Difficulty:** Easy

**Matching:**

75. Match the following terms to their meanings:

- |                            |   |
|----------------------------|---|
| I. Turing test             | A. software designed to replicate the knowledge of a human “expert” |
| II. expert system          | B. set of rules for constructing sentences from words               |
| III. automatic translation | C. the first area of AI research                                    |
| IV. checkers and chess     | D. if it acts intelligent, it is intelligent                        |
| V. syntax                  | E. Spanish “hola” for English “hello”                               |

**Answers:** D, A, E, C, B,

**Reference:** Multiple locations

**Difficulty:** Challenging

76. Match the following AI techniques to their specific examples:

- |                          |   |
|--------------------------|---|
| I. searching             | A. in a game of checkers, keep checkers in the king’s row as long as possible   |
| II. heuristics           | B. a chess move is successful, the computer will use it more often in the future  |
| III. pattern recognition | C. there are five possible chess moves in this situation, if I choose this...then this happens; if I choose this other option...then this other thing happens; etc. |
| IV. machine learning     | D. handwritten contest rules read using OCR technology  |

**Answers:** C, A, D, B

**Reference:** Opening Games

**Difficulty:** Moderate

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77. Match the following terms to their meanings:

- |                    |  |
|--------------------|--|
| I. semantics       | A. the “world” that the application deals with |
| II. domain         | B. contains only facts                         |
| III. database      | C. contains facts and relationships            |
| IV. knowledge base | D. the “real” meaning of words and phrases     |

**Answer:** D, A, B, C

**Reference:** Multiple Locations

**Difficulty:** Moderate