INFORMATION PROCESSING

Marilyn Bohl

FOURTH EDITION

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Contents

Chapter 1

COMPUTERS AND THEIR USES

True-False

1-1. T F In common practice, one person's information may be another
            person's data.

1-2. T F Magnetic-tape and magnetic-drum units are direct-access storage
            devices.

1-3. T F Business data processing with computer help predates computer-assisted
            scientific data processing.

1-4. T F Data can be processed without the help of a computer.

1-5. T F The first microprocessor was developed by engineers at Intel.

1-6. T F Prior to World War II, all data was processed either manually or
            mechanically.

1-7. T F Microprocessors are RAM chips.

1-8. T F Data can be written to or read from a magnetic disk in any order.

1-9. T F Instructions on punched paper tapes direct the operations of a
            stored-program computer.

1-10. T F TRS-80 and Apple II computers predate microprocessors.

1-11. T F Increasing the packaging density of computer components is a way of
            decreasing the speed of internal processing.

1-12. T F The storage densities of today's disk units are 5000 times greater
            than those of early disk devices.

1-13. T F Numerical control tapes are being used to direct computers in
            manufacturing environments.

1-14. T F Computer-assisted drill and practice is an individualized, self-paced
            learning activity.

1-15. T F Manufacturing firms are reducing on-hand stocks with no loss of
            production through computerized inventory-control procedures.

1-16. T F State and local law enforcement agencies can use computers to access
            federal records about persons officially accused of crimes.

1-17. T F A key advantage of home computers is that they need not be directed
            by stored programs.

1-18. T F Manufacturing resource planning systems are used to measure and sample production processes and adjust involved devices accordingly.

1-19. T F Computers are likely to become as basic to student learning as pencils and notebooks.

1-20. T F Simulation techniques are being used to change real-world situations with computer help.

1-21. T F Computers are used throughout the U.S. space program.

1-22. T F Robotic systems are programmable devices.

1-23. T F The widespread use of computers has created many new jobs in both large and small organizations.

1-24. T F A job for which training is needed when it's done by a person cannot be done by a computer.

1-25. T F A computer-using organization must employ system designers and programmers.

1-26. T F Operations personnel commonly work with users to understand their information needs.

1-27. T F Computer-using organizations need auditors who are knowledgeable about data processing.

1-28. T F By 1990, the U.S. labor force is expected to number about 160 million.

1-29. T F Microprocessors are prevalent in typical home environments.

1-30. T F For applications involving very large volumes of data, computerized data processing is not a likely alternative.

1-31. T F Computers can force students to learn.

1-32. T F By 1990, the U.S. labor force is expected to number about 280 million.

1-33. T F CAD/CAM is used extensively in both mechanical and electrical engineering.

1-34. T F Even within the time frame of the Computer Age, the use of computers for military purposes is a relatively recent development.

1-35. T F In the U.S. electoral process, people must still do the voting.

1-36. T F Transistors are no longer used in computers.

1-37. T F Through data processing, raw data is converted into useful information.

1-38. T F The design specifications created as output of computer-aided design must be expressed in a programming language before they can be used in computer-aided manufacturing.

1-39. T F Job opportunities for programmers are likely to decrease in this decade.

1-40. T F Where once a machinist worked at a drilling machine, a computer can now control the physical movement of machine parts.

Multiple-Choice

1-41. What was the first stored-program computer?

    (a) ABC

    (b) ENIAC

    (c) EDSAC

    (d) UNIVAC I

    (e) Mark I

1-42. What is the basic difference between data and information?

    (a) Data exists independently of computers.

    (b) All information consists of raw data.

    (c) All data consists of information.

    (d) All information consists of data that has been processed.

    (e) Information may be incomplete or irrelevant.

1-43. Which descriptor below best characterizes scientific data processing?

    (a) Large amounts of input, small amounts of calculating, and large amounts of output

    (b) Small amounts of input, small amounts of output, and small amounts of calculating

    (c) Large amounts of calculating, small amounts of input, and small amounts of output

    (d) Large amounts of output, large amounts of input, and large amounts of calculating

    (e) Large amounts of calculating, small amounts of output, and large amounts of input

1-44. What type of components served as basic building blocks in the world's first electronic digital computer?

    (a) electromagnetic relays

    (b) vacuum tubes

    (c) transistors

    (d) integrated circuits

    (e) magnetic cores

1-45. What was the major difference between the EDSAC and the ENIAC?

    (a) The EDSAC was dependent on electricity as a source of power.

    (b) The ENIAC was the world's first electronic digital computer.

    (c) The EDSAC was the world's first stored-program computer.

    (d) The ENIAC has its own internal memory, constructed of vacuum tubes.

    (e) The EDSAC was a binary-state machine, with automatic processing capabilities.

1-46. The first computer produced in quantities greater than one was the

    (a) Mark I.

    (b) UNIVAC I.

    (c) IBM 650.

    (d) ABC.

    (e) RAMAC.

1-47. What was the first magnetic medium used for direct storage?

    (a) magnetic tape

    (b) magnetic belt

    (c) magnetic disk

    (d) magnetic core

    (e) magnetic drum

1-48. Which of the following lists of components is ordered chronologically?

    (a) transistors, magnetic tape, integrated circuits

    (b) vacuum tubes, magnetic disk, magnetic tape

    (c) electromagnetic relays, integrated circuits, vacuum tubes

    (d) integrated circuits, vacuum tubes, magnetic drum

    (e) vacuum tubes, transistors, integrated circuits

1-49. Who developed the world's first electromechanical computer?

    (a) Herman Hollerith

    (b) a team of Harvard graduate students and IBM engineers

    (c) the U.S. Navy

    (d) the Computing-Tabulating-Recording Company

    (e) John W. Mauchly and J. Presper Eckert

1-50. In what general time frame was the first microprocessor developed?

    (a) 1954-56

    (b) 1964-65

    (c) 1969-71

    (d) 1975-76

    (e) 1980-81

1-51. What was the most significant characteristic of the first microprocessor?

    (a) versatility

    (b) portability

    (c) packaging density

    (d) reliability

    (e) compactness

1-52. What user needs stimulated the development of the first punched-card data-processing system?

    (a) World War I ballistic missile testing requirements

    (b) the U.S. Bureau of Census' processing of census data

    (c) the U.S. Navy's strategic weapons development

    (d) World War II logistics problems

    (e) large corporation needs for business data processing

1-53. What is productivity?

    (a) a cost/benefit ratio applied for budgeting purposes

    (b) the total volume of output produced by an individual or group

    (c) a measure of performance applied to automated processes

    (d) the rate of finished output per unit of labor input

    (e) a ratio of labor costs per person month

1-54. Process-control computers are prevalent in

    (a) small businesses.

    (b) steel mills, paper plants, and oil refineries.

    (c) the automotive, aerospace, and heavy-equipment industries.

    (d) the banking industry and related financial applications.

    (e) electrocardiograph systems, CAT scanners, and other patient-monitoring devices.

1-55. About how many home computers were sold in 1982?

(a) 2 million

(b) 200,000

(c) 50,000

(d) 100 million

(e) 300,000

1-56. Computer-assisted modeling is called

(a) drill and practice。

(b) process control.

(c) CAM.

(d) CAD/CAM.

(e) simulation.

1-57. All computer-using organizations need in-house

(a) database administrators.

(b) programmers.

(c) system analysts.

(d) system designers.

(e) operations personnel.

1-58. In terms of total number of workers, what's happening to the U.S. labor force?

(a) increasing at a 17 to 22 percent rate

(b) decreasing at a rate of 4 to 6 percent

(c) expected to reach 105 million by 1990

(d) increasing at a rate of 10 to 12 percent per year

(e) decreasing faster in the 1980s than in preceding decades

1-59. In which of the job categories below is the number of job opportunities decreasing rather than increasing?

(a) programmers

(b) technical writers

(c) system analysts

(d) keypunch operators

(e) computer service personnel

1-60. In which job category is the number of job opportunities expected to increase the fastest, on a percentage basis?

(a) system analysts

(b) programmers

(c) technical writers

(d) electrical engineers

(e) data-entry personnel

1-61. Early computers were viewed primarily as

(a) weapons of war and instruments for peace.

(b) number crunchers for scientific, mathematical, and engineering problems.

(c) special-purpose machines for business data processing.

(d) incredibly slow but awesome devices.

(e) especially useful to universities as research tools and status symbols.

1-62. Techniques whereby the computer sets up a lifelike situation and then changes the situation as a user reacts to it are called

(a) stimulus response.

(b) direct interaction.

(c) adaptive learning.

(d) drill and practice.

(e) simulation.

1-63. Computers were first sold as commercial ("off-the-shelf") products in

(a) 1946.

(b) 1951.

(c) 1954.

(d) 1959.

(e) 1963.

1-64. Computer-assisted walking is accomplished through

(a) stored-program control of artificial limbs.

(b) the integration of human systems with robotic systems.

(c) repetitive, systematic conditioning of a patient's involuntary responses.

(d) electrical stimulation of a patient's muscle activity.

(e) controlled stimulation of a patient's thought processes.

1-65. What types of internal components are most associated with second-generation computers?

(a) vacuum tubes

(b) logic gates

(c) transistors

(d) integrated circuits

(e) circuit boards

1-66. What is the major advantage of computer-aided design?

(a) preciseness in the representation of fine work

(b) facilities to store and recall vast amounts of data

(c) reduction in the time needed to move a product from design to manufacture

(d) increased freedom to manipulate and work with ideas during design

(e) ability to integrate the work of multiple designers into one product

1-67. The user of a home information system is most likely to be interested in

(a) NCIC.

(b) The Source.

(c) PLATO.

(d) VLSI.

(e) MED/Mail.

1-68. The transfer resistor, or transistor, was invented by

(a) research scientists at General Electric Appliance Park.

(b) Hewlett-Packard engineers.

(c) researchers at IBM and graduate students at Harvard.

(d) Ted Hoff and associates at Intel.

(e) scientists at Bell Labs.

Short-Answer

1-69. What advantages does magnetic tape offer over punched cards as a
data-recording medium?

1-70. How does batch processing differ from transaction processing?

1-71. In what way are microprocessors "the crude oil of electronics"?

1-72. What benefits do techniques of large-scale integration and very-large-scale
integration offer to users?

1-73. Explain briefly six ways in which computers are aiding manufacturing.

1-74. Explain briefly how designers in three different fields of human
activity are using computer simulation as a design tool.

1-75. Explain briefly six general approaches to the use of computers for
educational purposes.

Note: Less-inclusive questions, any of which can be answered on the
basis of the information given on pages 27 through 29 of Information
Processing, include:

1-75A. Show, by example, how the computer is used in problem solving.

1-75B. Distinguish between computer-managed instruction and computer-assisted
instruction.

1-75C. Show, by example, how computer simulation is serving as a learning aid.

1-75D. How are computer systems with inquiry capabilities decreasing both the
time and effort (tediousness!) that students must spend in many learning
activities?

1-75E. In what ways are both teachers and students being assisted by computers
when testing occurs?

1-75F. For what kinds of subject matter is computer-assisted drill and practice
suitable, and why?

1-76. What job opportunities for persons knowledgeable about data processing
may be available in computer-using organizations?

1-77. What job opportunities exist for DP-knowledgeable people who want to
work for themselves?

Chapter 2

THE COMPUTER AS A SYSTEM

True-False

2-1. T F Before data can be processed by a computer, it must be entered into the computer's internal storage unit.

2-2. T F On most systems, a RUN command or its equivalent is used to start the computer.

2-3. T F The control section of the CPU performs processing operations on data.

2-4. T F All data processing involves input, processing, and output.

2-5. T F Once processing is initiated, stored-program instructions are executed automatically by the computer.

2-6. T F EDP systems no longer have system consoles.

2-7. T F The physical components of a computer system are collectively referred to as firmware.

2-8. T F A printer is a widely used secondary-storage device.

2-9. T F More than one program at a time can be stored in the computer.

2-10. T F A program can be entered directly into computer storage, line by line, from the keyboard of a terminal or microcomputer.

2-11. T F A computer cannot be expected to solve a problem that no person understands how to solve.

2-12. T F Secondary storage is auxiliary storage.

2-13. T F Data cannot be keyed directly into a computer system.

2-14. T F Data can be processed effectively without computer help.

2-15. T F Either system or application software is needed in a computer system.

2-16. T F A computer can produce output that is input to another machine, thereby achieving direct machine-to-machine communication.

2-17. T F A password is a unique identifier, unknown to even the computer.

2-18. T F Both instructions and data must be in primary storage during processing.

2-19. T F Even a child can do data processing.

2-20. T F As system and application software increases in sophistication, more human intervention is required during processing.

2-21. T F A CPU is a processor.

2-22. T F A computer system is an EDP system.

2-23. T F No computer can process data unless it's directed to do so by a program.

2-24. T F The computer's control section performs tests and comparisons during processing.

Multiple-Choice

2-25. Secondary-storage devices are used

   (a) as a supplement to virtual storage in some environments.

   (b) instead of primary storage in microcomputer systems.

   (c) as backup for magnetic-tape units.

   (d) to hold data where it can be retrieved as needed during processing.

   (e) to hold programs while they are being executed.

2-26. Microprograms

   (a) are used instead of stored programs on personal computers.

   (b) are used to tailor the basic operations of a computer to meet the user's data processing requirements.

   (c) are small sequences of instructions not intended for reuse.

   (d) are entered into primary storage during processing.

   (e) are part of the software of an EDP system.

2-27. Which of the terms below should not be grouped with the others?

   (a) primary storage

   (b) secondary storage

   (c) main storage

   (d) memory

   (e) internal storage unit

2-28. A computer operates

   (a) under the direction of stored-program instructions.

   (b) without necessarily being programmed to do so.

   (c) in response to operator commands and system messages.

   (d) as directed by hard-wired circuitry.

   (e) as a calculator but with increased speed and accuracy.

2-29. Read-only memory

   (a) serves as the system input unit on a microcomputer.

   (b) is required for business data processing.

   (c) is external to the processor unit.

   (d) serves as secondary storage during processing.

   (e) cannot be occupied by user data during processing.