

# DANTES

## Subject Standardized Tests

## Fact Sheet Study Guide

### **INTRODUCTION TO COMPUTING**

#### TEST INFORMATION

This test was developed to enable schools to award credit to students for knowledge equivalent to that which is learned by students taking the course. The school may choose to award college credit to the student based on the achievement of a passing score. The passing score for each examination is determined by the school based on recommendations from the American Council on Education (ACE). This minimum credit-awarding score is equal to the mean score of students in the norming sample who received a grade of C in the course. Some schools set their own standards for awarding credit and may require a higher score than the ACE recommendation. Students should obtain this information from the institution where they expect to receive credit.

The use of non-programmable calculators is permitted during the test. Scratch paper for computations should be provided.

#### CONTENT

The following topics, which are commonly taught in courses on this subject, are covered by this examination.

- |   | <b>Approximate<br/>Percent</b> |
|---|--------------------------------|
| I. Computer Organization and Hardware   | <b>20%</b>                     |
| A. Processing components (CPU, ALU, Fetch/Execute cycle)                                  |                                |
| B. Primary storage (RAM, ROM, cache, virtual memory)                                      |                                |
| C. Peripherals (secondary storage, I/O devices, disk technology, communications hardware) |                                |
| D. Architectures (personal computers, workstations, mainframes, digital/analog)           |                                |

**Approximate  
Percent**

- |  |            |
|--|------------|
| E. Data representation (bits, bytes, words, numbering systems, coding systems, graphic and multimedia formats) |            |
| F. Units of measurement (kilobytes, megahertz, microseconds, baud, bps, etc.)                                  |            |
| II. Systems Software   | <b>15%</b> |
| A. Operating systems (single-user, multi-user, resource allocation, job scheduling, file management)           |            |
| B. Utilities (virus detection, backup, disk maintenance)   |            |
| C. Software development tools (profilers, debuggers, editors, compilers/interpreters)                          |            |
| D. User interfaces (command line, menu-driven, graphical)  |            |
| III. Application Software  | <b>15%</b> |
| A. Word processing and desktop publishing  |            |
| B. Spreadsheets (macros)   |            |
| C. Hypertext, multimedia and presentation software   |            |
| D. Data bases  |            |
| 1. Levels of hierarchy (fields, records, files)  |            |
| 2. Access mechanisms (random, sequential, access times)  |            |
| 3. Data base models (relational, network, hierarchical, object)  |            |
| E. Graphics (draw, paint, CAD, image processing)   |            |



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D. Careers in Computer Science and Information Systems

**Approximate  
Percent  
20%**

IV. Communications and Networks

- A. World Wide Web (browsers, HTML, applets, search engines)
- B. Personal communications (electronic mail, list servers, chat groups, newsgroups)
- C. Network access (file transfer, TELNET, internet service providers (ISPs))
- D. Network architectures (local area networks, wide area networks, client server, network topology, domains)
- E. Data communications (error detection, data compression (tar, zip), encryption schemes)

V. Software Development

**15%**

- A. Software life cycle (analysis, design, development, debugging, testing, maintenance)
- B. Programming language paradigms
- C. Algorithms
- D. Data types (primitive, composite, object, user-defined)
- E. Input/Output
- F. Expressions, syntax, semantics
- G. Logic concepts
- H. Control structures (sequence, conditional, iteration)
- I. Functions, procedures, macros
- J. Computability/limitations

VI. Social Impact and History

**15%**

- A. History (significant people, machines, and events; digital revolution, evolution of user interfaces)
- B. Social issues (ethical/legal issues, privacy concerns, intellectual property rights, impact on labor force, artificial intelligence, network etiquette, year 2000)
- C. Safety and Security (viruses, system access, privacy in on-line services, encryption, firewalls, hacking, spamming)

## SAMPLE QUESTIONS

- The number F3 (base 16) is equivalent to
  - 0011 1111 (base 2)
  - 1100 1111 (base 2)
  - 1111 0011 (base 2)
  - 1111 1100 (base 2)
- Which of the following computers is intended to support the largest number of users simultaneously?
  - Personal computer
  - Workstation
  - Graphics terminal
  - Mainframe
- What translates a high-level programming language into machine language?
  - A compiler
  - A browser
  - An assembler
  - An expert system
- What is the term for a utility program that is used to make a copy of all the files on a disk?
  - Backup
  - Defragmenter
  - Formatter
  - Translator
- Which of the following keys is NOT generally held down while pressing another key?
  - <shift>
  - <ctrl>
  - <alt>
  - <esc>
- What is the term for a computer that processes requests from other computers to access a data base?
  - Client
  - Data warehouse
  - Server
  - Router
- Communication between computers on the Internet is enabled by
  - Visual BASIC
  - SQL
  - TCL/TK
  - TCP/IP
- The programming language that popularized the use of applets on the World Wide Web is
  - C++
  - Java
  - Ada
  - GUI
- Which stage of the software life cycle usually requires the most time and effort?
  - Design
  - Requirements analysis
  - Maintenance
  - Coding
- Consider the following pseudocode segment.

```
if y < 100 then
  x = 1
else
  x = -1
```

Which of the following must be true after the pseudocode is executed?
  - The value of y must be less than 100.
  - The value of y must be greater than the value of x.
  - If the value of y is 99, the value of x is also 99.
  - If the value of y is 200, the value of x is -1.
- The first electronic digital computer was produced in the
  - 1920's
  - 1940's
  - 1960's
  - 1980's

12. What is a mechanism that prevents unauthorized access to computers that reside on a network?

- (A) Sniffer
- (B) Spoofer
- (C) Firewall
- (D) Ethernet

## STUDYING FOR THE EXAMINATION

The following is a list of reference publications that were being used as textbooks in college courses of the same or similar title at the time the test was developed. Appropriate textbooks for study are not limited to those listed below. If you wish to obtain study resources to prepare for the examination, you may reference either the current edition of the following titles **or** textbooks currently used at a local college or university for the same class title. It is recommended that you reference **more than one textbook** on the topics outlined in this fact sheet. You should **begin by checking textbook content against the content outline** included on the front page of this Fact Sheet/Study Guide **before** selecting textbooks that cover the test content from which to study. Textbooks may be found at the campus bookstore of a local college or university offering a course on the subject.

Sources for study material suggested but not limited to the following:

### General Computer Concepts

Abemethy, Ken, and Tom Allen. *Exploring the Digital Domain: An Introduction to Computing with Multimedia and Networking*. Boston, MA: PWS Publishing Company, current edition.

Brookshear, J. Glenn. *Computer Science: An Overview*. Reading, MA: Addison-Wesley Longman, Inc., current edition.

Long, Larry, and Nancy Long. *Computers*. Upper Saddle River, NJ: Prentice Hall, current edition.

Norton, Peter. *Peter Norton's Introduction to Computers*. New York, NY: Glencoe McGraw-Hill, current edition.

Parsons, June Jamrich, and Dan Oja. *Computers, Technology, and Society*. Cambridge, MA: Course Technology, current edition.

Schneider, G. Michael, and Judith L. Gersting. *An Invitation to Computer Science*. St. Paul, MN: West Publishing Company, current edition.

Williams, Brian K., Stacey C. Sawyer, and Sarah E. Hutchinson. *Using Information Technology: A Practical Introduction to Computers and Communications*. Chicago, IL: Irwin, current edition.

### Social and Ethical Issues

Baase, Sara. *A Gift of Fire: Social, Legal, and Ethical Issues in Computing*. Upper Saddle River, NJ: Prentice Hall, current edition.

Ermann, M. David, Mary B. Williams, and Michele S. Shauf. *Computers, Ethics and Society*. New York, NY: Oxford University Press, current edition.

### Communications and Networks

Sanford, Clive C. *Exploring the Internet*. Chicago, IL: Irwin, current edition.

White, Curt M. *Data Communications and Computer Networks - An OSI Framework*. Danvers, MA: Boyd and Fraser Publishing Company, current edition.

Current textbook used by a local college or university for a course on the subject.

## CREDIT RECOMMENDATIONS

The Center for Adult Learning and Educational Credentials of the American Council on Education (ACE) has reviewed and evaluated the DANTES examination development process. ACE has made the following recommendations:

Area or Course	
Equivalent:	Introduction to Computing
Level:	Baccalaureate
Amount:	Three (3)
semester hours	
Source:	ACE Commission on Educational Credit and Credentials

## INFORMATION

Colleges and universities that would like to have review copies of tests, have additional information about the national norming, or assistance in local norming or score validation studies should write to: DANTES Program, Mail Stop 11-P, The Chauncey Group International, 664 Rosedale Road, Princeton, New Jersey 08540.

It is advisable that schools develop a consistent policy about awarding credit based on scores from this test and that the policy be reviewed periodically. The Chauncey Group will be happy to help schools in this effort.

**Correct Responses to sample questions: 1.C; 2.D; 3.A; 4.A; 5.D; 6.C; 7.D; 8.B; 9.C; 10.D; 11.B; 12.C.**

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