

**APPENDIX**  
**OBJECTIVE/SHORT QUESTIONS**

**A. MULTIPLE CHOICE TYPE**

1. In computer terminology, information means  
(a) raw data (b) data in more useful or intelligible form  
(c) alphanumeric data (d) program
2. Which one of the following belongs to the first generation of computers?  
(a) ENIAC (b) UNIVAC  
(c) IBM 8090 (d) IBM 1401
3. Hollerith code is used for  
(a) CPU (b) magnetic drums  
(c) paper tape (d) floppy drives  
(e) punched cards.
4. Which one of the following is not a hardware?  
(a) compiler (b) CPU  
(c) memory unit (d) computer  
(e) chip
5. An integrated circuit is  
(a) a complicated circuit (b) an integrating device  
(c) much costlier than a single transistor (d) fabricated on a tiny silicon chip
6. The *Father of Punched Card Processing* was  
(a) J. Presper Eckert (b) Charles Babbage  
(c) Blaise Pascal (d) Dr. Herman Hollerith
7. The first computer made available for commercial use was  
(a) Mark - I (b) ENIAC  
(c) UNIVAC (d) EDSAC
8. A hybrid computer  
(a) resembles analog computer (b) resembles digital computer  
(c) resembles both analog and digital computer (d) resembles none, of (a), (b), (c)
9. Most of the errors blamed on computers are actually due to  
(a) programming errors (b) hardware fatigue  
(c) operation of all types of computer equipment  
(d) data entry errors
10. A billionth of a second is defined as a  
(a) millisecond (b) microsecond  
(c) nanosecond (d) picosecond
11. A digital computer system consists of a central processing unit (CPU) interfaced with  
(a) input devices (b) auxiliary storage  
(c) output devices (d) all of the above  
(e) none of the above
12. The radix of a number system  
(a) is variable  
(b) has nothing to do with digit position value

- (c) equals the number of its distinct counting digits  
(d) is always an even number
13. A microprocessor has memory location from 0000 to 3 FFF, each storing one byte. The number of bytes the memory can store is  
(a) 8192 (b) 16384  
(c) 32768 (d) 4096  
(e) 65536
14. The term 'word' in computer terminology refers to  
(a) bits formed into groups (b) coded instructions  
(c) memory size (d) language used  
(e) stored instructions
15. Storage of 1K means that it has following number of storage locations;  
(a) 1000 (b) 964  
(c) 1024 (d) 1032  
(e) 1036
16. What is the number of bits needed for an address in a 4K memory?  
(a) 6 (b) 8  
(c) 12 (d) 16
17. Which one of the following is not a magnetic memory;  
(a) core (b) disk  
(c) flip-flop (d) tape  
(e) drum
18. Which one of the following has a volatile memory;  
(a) magnetic core (b) disk  
(c) drum (d) tape  
(e) flip-flop
19. Which one of the following has a random access memory (RAM)?  
(a) tape (b) drum  
(c) core (d) disk  
(e) floppy
20. One of the disadvantages of RAM is that it is  
(a) slow (b) volatile  
(c) inaccurate (d) bulky  
(e) more power consuming
21. The term 'memory' applies to which one of the following?  
(a) logic (b) storage  
(c) control (d) input device  
(e) output device
22. ROM is composed of:  
(a) magnetic cores (b) microprocessors  
(c) photoelectric cells (d) floppy disks
23. Which one of the following is an example of nonvolatile memory?  
(a) ROM (b) RAM  
(c) LSI (d) VLSI  
(e) none of these

24. What is the name given to the specialised storage element in the processor unit of a computer which is used as a *scratch pad* during processing operations?
- (a) storage register (b) primary memory  
(c) cache memory (d) accumulator
25. If in a computer 16 bits are used to specify addresses in a RAM, the number of address will be
- (a) 4 K (b) 8 K  
(c) 16 K (d) 32 K
26. Register is a
- (a) Set of capacitors used to register input instructions in a digital computer  
(b) set of paper tapes and cards put in a file  
(c) temporary storage unit within the CPU having dedicated or general purpose use  
(d) part of the auxiliary memory  
(e) device to convert current signal into voltage signal
27. Magnetic tape falls under the category of
- (a) main memory (b) core memory  
(c) cache memory (d) RAM memory  
(e) auxiliary storage device
28. The time taken for the read/write head to move to the correct track on the magnetic disk is called
- (a) search delay (b) latency delay  
(c) seek time (d) approach time
29. Which one of the following is not hardware:
- (a) card (b) magtape  
(c) printer (d) assembler  
(e) CRT
30. If a computer uses 500 characters, how many bits this system requires to give a different code to all characters?
- (a) 5 bits (b) 7 bits  
(c) 8 bits (d) 9 bits  
(e) 10 bits
31. Binary Coded Decimal (BCD) numbers express each decimal digit as
- (a) binary digit (b) digits and strings  
(c) nibble (d) word  
(e) byte
32. The main advantage of hexadecimal numbers is the ease of conversion from hexadecimal to
- (a) decimal (b) binary  
(c) octal (d) BCD  
(e) ASCII code
33. The parity check code is used in the digital computer system to
- (a) detect error (b) correct error  
(c) analyse error (d) either detect or correct error  
(e) both detect and correct error
34. In computer terminology, an assembler means

- (a) a person who assembles the parts  
(c) a person who writes program  
(e) a hardware unit of computer
35. In computer terminology, a compiler means  
(a) a person who computes source program  
(b) the same thing as a programmer  
(c) key punch operator  
(d) a program which translates source program into object program
36. A program written in machine language is called program  
(a) assembler  
(c) computer  
(b) object  
(d) machine
37. A collection of software that controls the overall operation of a computer is called  
(a) application software  
(c) system software  
(e) programming language  
(b) packaged program  
(d) operating system
38. A bootstrap is  
(a) a memory device  
(b) an input/output device  
(c) a device to support computer  
(d) a small initialisation computer program to start up an inactive computer  
(e) an error correction device/technique
39. Multiprogramming is  
(a) writing two or more programs at a time  
(b) incorporating more than two programs in a single program  
(c) using more than two programs to solve a problem  
(d) processing of two or more program in the computer at the same time  
(e) using many backing stores in a program
40. The interleaved execution of two or more different and independent programs by the CPU of a computer is called  
(a) multiprocessing  
(c) multitasking  
(e) none of the above  
(b) multiprogramming  
(d) either (b) or (c)
41. Execution of instructions from different and independent programs by a computer simultaneously is called  
(a) multiprogramming  
(c) concurrent programming  
(b) multiprocessing  
(d) multitasking
42. A multiprogramming system is one that can  
(a) compute many programs simultaneously  
(b) share hardware resources with many programs simultaneously  
(c) run very fast  
(d) use many operating systems
43. Debug is a term denoting  
(a) error correction process  
(b) writing of instructions in developing a new program  
(c) fault detection in equipment

- (d) determining useful life  
(e) health of an equipment
44. A logic gate is an electronic circuit which  
(a) makes logic decisions (b) allows election flow only in one direction  
(c) works on binary algebra (d) alternates between 0 and 1 values
45. In positive logic, logic state 1 corresponds to  
(a) positive voltage (b) higher voltage level  
(c) zero voltage (d) lower voltage level
46. In negative logic, the logic state 1 corresponds to  
(a) negative voltage (b) zero voltage  
(c) more negative voltage (d) lower voltage level
47. Truth table of a logic function  
(a) summarises its output values (b) tabulates all its input conditions  
(c) displays all its input/output possibilities (d) is not based on logic algebra
48. The output of a 2 input OR gate is 0 only when its  
(a) both inputs are 0 (b) either input is 1  
(c) both inputs are 1 (d) either input is 0
49. When an input electrical signal A = 10100 is applied to a NOT gate, its output signal is  
(a) 01011 (b) 10101  
(c) 10100 (d) 00101
50. The only function of a NOT gate is to  
(a) stop a signal (b) complement a signal  
(c) invert an output signal (d) act as a universal gate
51. What is the number of binary digits which can be added by a full adder?  
(a) 2 (b) 3  
(c) 4 (d) 8
52. What is the name of a logic circuit which can add two binary digits?  
(a) full adder (b) half adder  
(c) parallel adder (d) flat register
53. A group of wires running parallel to each other between two connected computer parts and which transfers information is called a  
(a) track (c) bus  
(c) cable (d) bundle
54. The most common input device used today is the  
(a) Motherboard (b) central processing unit  
(c) keyboard (d) system unit  
(e) semiconductor
55. What is the name of the display feature that highlights area of the screen which require operator attention?  
(a) pixel (b) reverse video  
(c) touch screen (d) cursor
56. Which one of the following is considered a direct entry input device?  
(a) optical scanner (b) mouse  
(c) light pen (d) digitizer  
(e) all of the above

57. Which one of the following is considered a direct entry input device?  
 (a) keyboard (b) light pen  
 (c) digitizer (d) optical scanner  
 (e) none of the above
58. What does OCR stand for?  
 (a) outsized character reader (b) optical character recognition  
 (c) operational character reader (d) only character reader
59. Which is not necessary when using bar codes in supermarkets?  
 (a) Point-of-Sale (POS) terminal (b) check digit on the bar code  
 (c) price digit on the bar code (d) price on the goods
60. When a computer mouse moves over the table surface the track ball is  
 (a) stationary (b) difficult to move  
 (c) dragged (d) moved in small steps
61. A trackball is manipulated by  
 (a) palm (b) foot  
 (c) fingers (d) sound
62. Which one of the following printers used in conjunction with computers uses dry ink powder?  
 (a) daisywheel printer (b) line printer  
 (c) laser writer (d) thermal printer
63. Which one of the following printers cannot print graphics?  
 (a) ink-jet (b) daisywheel  
 (c) laser (d) dot matrix
64. Which part of the diskette should never be touched?  
 (a) hub (b) hole in the centre  
 (c) oval slot (d) corner
65. What is the alternative name for a diskette?  
 (a) winchester disk (b) flexible disk  
 (c) hard disk (d) floppy disk
66. Which one of the following is a character-at-a-time printer?  
 (a) chain printer (b) bank printer  
 (c) drum printer (d) daisywheel printer
67. Which one of the following printers can be classified as a page-at-a-time printer?  
 (a) laser printer (b) dot matrix printer  
 (c) thermal printer (d) inkjet printer
68. Dot matrix is a type of  
 (a) tape (b) printer  
 (c) disk (d) bus
69. Head crash in a disk means  
 (a) disk broken due to high centrifugal forces  
 (b) disk damaged due to dust particles  
 (c) read/write head coming in contact with disk surface  
 (d) disk comes to a stop  
 (e) read/write head damaged

70. Which one of the following languages is usually implemented with an interpreter?  
 (a) assembly (b) PASCAL  
 (c) COBOL (d) BASIC
71. FILLER must be defined by a (n):  
 (a) a PICTURE clause (b) X PICTURE clause  
 (c) 9s PICTURE clause (d) a and b
72. The PICTURE clause PIC A (4) defines a (n):  
 (a) alphameric field (b) field composed of 4 As  
 (c) alphabetic four-character field (d) four-character numeric field
73. A required entry within the IDENTIFICATION DIVISION is  
 (a) the PROGRAM-ID statement (b) the DATE-WRITTEN instruction  
 (c) an AUTHOUR statement (d) all of the above
74. How many divisions are there in COBOL programme:  
 (a) 2 (b) 3  
 (c) 4 (d) 5
75. The first division in a COBOL programme is  
 (a) environment division (b) identification division  
 (c) data division (d) Algol division
76. In the environment division, how many sections are there?  
 (a) 3 (b) 4  
 (c) 1 (d) 2
77. Working - Storage section is included under which one of the following divisions:  
 (a) data division (b) environment division  
 (c) identification division (d) Algol division
78. The ACCEPT statement requires the use of  
 (a) an FD  
 (b) a SELECT clause  
 (c) an 01 - level WORKING - STORAGE entry  
 (d) a 77 leave; WORKING - STORAGE entry
79. Tick the correct answer in the following:
- (i) Which one of the following is not a CPU register? [AMIE, W'97]  
 (a) memory address register (b) memory control register  
 (c) program counter (d) instruction register
- (ii) The full form of RAM is  
 (a) Random Access Memory (b) Read At-a-time Memory  
 (c) Read Access Memory (d) None of the above
- (iii) A collection of bits is called a byte  
 (a) 2 (b) 4  
 (c) 8 (d) 12
- (iv) High level languages are called generation languages as  
 (a) first (b) second  
 (c) third (d) fourth
- (v) Machine language is faster in execution because  
 (a) it has very short commands

- (b) computer directly starts executing it  
 (c) 0's and 1's are easily represented in the memory  
 (d) it does not require linking with any other module
- (vi) An operating system  
 (a) is most important system software'  
 (b) manages a computer resource very effectively  
 (c) (a) and (b)  
 (d) became a part of computer software with third generad computers
- (vii)  $(2040)_{10}$  can be represented in hexadecimal system as  
 (a) 3770 (b) 7E8  
 (c) 11111111000 (d) none of the above
- (viii) The value of  $I$  in FORTRAN expression  $I = J/2 * 4$  ( $J = 3$ ) will be  
 (a) 4 (b) 6  
 (c) 0 (d) none of the above
- (ix) In a COBOL program, column 7 cannot have the character  
 (a) \* (b) -  
 (c) / (d) +

(x) The matrix  $A$  is  $\begin{bmatrix} 1 & -1 \\ 0 & 1 \end{bmatrix}$ .  $A^{-1}$  will be

(a)  $\begin{bmatrix} 1 & -1 \\ 0 & 1 \end{bmatrix}$

(b)  $\begin{bmatrix} 1 & 0 \\ 1 & 1 \end{bmatrix}$

(c)  $\begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix}$

(d)  $\begin{bmatrix} 1 & 0 \\ -1 & 1 \end{bmatrix}$

80. For each of the following, write the correct answer as (a), (b), (c) and (d) as the case may be:

- (i) A hexadecimal counter is to count up to  $10000_{10}$ . The minimum number of bits for this counter is  
 (a) 3 (b) 4  
 (c) 5 (d) 6
- (ii) Which one of the following is unit distance code?  
 (a) 2 - 4 - 2 - 1 BCD (b) 7 - 4 - 2 - 1 BCD  
 (c) XS - 3 (d) gray code
- (iii) Which one of the following is not used as input device to computer?  
 (a) digitizing tablets (b) light pen  
 (c) MICR (d) concentrator
- (iv) Winchester disk is a  
 (a) protected hard disk (b) floppy disk  
 (c) optical disk (d) bubble memory
- (v) Which one of the following is not permitted in arithmetic expression in FORTRAN?  
 (a)  $X - Y * D$  (b)  $X/Y - Y * Z$   
 (c)  $X ** Y ** Z$  (d)  $X * (Y + Z) - Y ** X$
- (vi) Which one of the following is used to skip characters on the input records?



- (a) A field (b) H field  
(c) D field (d) X field
- (vii) Which one of the following is used for correcting error in one of the values of a function given in a table?  
(a) Taylor's series difference (b) successive difference  
(c) Simpson's rule (d) Euler's method
- (viii) Pivotal condensation is used for  
(a) evaluation of determinants of matrix (b) matrix inversion  
(c) determination of eigenvalues (d) solution of simultaneous equations
- (ix) ALGOL does not possess  
(a) modular structures (b) symbolic expressions  
(c) if ... then ... else structure (d) declaration statements
- (x) Which one of the following is used to move the cursor on the screen of a terminal by a small amount?  
(a) light pen (b) joystick  
(c) mouse (d) optical tablet
81. Tick the correct answer in the following. Write the correct alternative in your answerbook.
- (i) The logical expression. NOT. (X.EQV.Y) will be evaluated as (take X as true and Y as false)  
(a) false (b) true  
(c) invalid (d) depends on the compiler
- (ii) For a FORTRAN statement DO 10 I = 1, 12, 2 the loop will be executed:  
(a) 12 times (b) 6 times  
(c) 7 times (d) 13 times
- (iii) For a matrix  $\begin{bmatrix} 1 & 4 \\ 3 & 2 \end{bmatrix}$ , one eigen value is 5, the other will be  
(a) 2 (b) -2  
(c) 1 (d) -1
- (iv) Euler's method is provided for  
(a) numerical integration  
(b) solving linear equations  
(c) solving ordinary differential equations  
(d) solving partial differential equations
- (v)  $3x + 5$  may possess the non-trivial solution if value of is  
(a) 3 (b) -3  
(c) 0 (d) 3
- (vi) For a magnetic disk, the seek time is  $25 \times 10^{-6}$ s and rotational delay (latency time) is  $10 \times 10^{-6}$ s, the access time will be  
(a)  $15 \times 10^{-6}$ s (b)  $35 \times 10^{-6}$ s  
(c)  $25 \times 10^{-6}$ s (d)  $10 \times 10^{-6}$ s
- (vii) DOS is a  
(a) compiler (b) high level language  
(c) operating system (d) machine language
- (viii) With 5 bits, it is possible to represent

- |   |                       |
|---|-----------------------|
| (a) 32 characters   | (b) 64 characters     |
| (c) 5 characters  | (d) 10 characters     |
| (ix) The register which keeps track of the instruction which is to be executed next is called |                       |
| (a) memory address register   | (b) program counter   |
| (c) instruction register  | (d) none of the above |
| (x) 1 KB is equal to (number of bytes)  |                       |
| (a) 8   | (b) 1000              |
| (c) 1000000   | (d) 1024              |

### B. TRUE/FALSE TYPE

Answer true or false for the following statements:

1. A computer is said to be dedicated when it is used for special purposes.
2. System software is more general than application software.
3. A microsecond is 1000 times longer than a nanosecond.
4. ENIAC was the first programmable computer.
5. MIPS is the measure system has a base of 16.
6. The hexadecimal numbering system has a base of 6.
7. The octal numbering system has a base of 6.
8. Bit is the singular for byte.
9. 8-bit EBCDIC can represent 256 characters.
10. In a computer, variable sized words are used.
11. Magnetic tape can only support direct access files.
12. A megabyte main memory can be effectively enlarged to gigabyte size by virtual memory system.
13. Inter block gap in magnetic tape occurs between two different files.
14. The largest positive integer that can be stored in a word of 8-bit is 127.
15. Using 16 bit address, one can address upto 64 K memory locations.
16. The storage capacity of a computer system is called the primary size.
17. The contents of ROM are easily changed.
18. There is no way to directly access data on magnetic tape.
19. The CPU has direct access to each location of main storage.
20. Operating systems are electronic circuitry.
21. SPOOLING helps certain of steady work load on electromechanical devices.
22. Multiprogramming involves parallel activity of I/O device, processors and memory.
23. The operating system is a hardware feature of the computer.
24. Multiprocessing will not require any extra hardware as compared to multiprogramming.
25. Multiprogramming requires the use of multiple CPUs.
26. Multiprocessing enables the simultaneous execution of two program statements.
27. Non-impact printer with laser beams can print a whole page at a time.
28. Line printers are slower than the dot matrix printers.
29. The magnetic tapes can be used for random access.
30. Line printers are faster than dot matrix printers.
31. With some OCR devices, handwritten material can be read.
32. A disadvantage of tapes is that they can only be processed sequentially.
33. A chain printer is an example of an impact printer, while a drum printer is an example of non-

- impact printer.
34. Ink-jet printers are classified as impact printers.
  35. Magnetic disks have both direct (or random) and sequential access capabilities.
  36. Optical memory storage techniques involve the use of lasers to store data.
  37. An OCR machine can read all types of handwriting.
  38. An optical character recognition machine can read typewriter data.
  39. Truth tables can be used to describe a logic function.
  40. Logic gates work on binary logic.
  41. Logical represents positive voltage in positive logic and a negative voltage in negative logic.
  42. Logic algebra is essentially the same as numerical algebra.
  43. All variables in Boolean algebra can only assume either the value 0 or 1.
  44. All inputs of an OR gate must be in OFF position to turn the output OFF.
  45. Logic OR gate performs logic addition which is exactly like arithmetic addition.
  46. The OR gate has an output 1 when either A or B is 1.
  47. In logic addition,  $A + A = 2A$ .
  48. In logic addition,  $A \cdot A = A^2$ .
  49. In an AND gate, all input must be in ON position to have an output.
  50. An AND gate performs logic addition.
  51. The logic AND operation is analogous to multiplication in simple algebra.
  52. The logic NOT function can have more than one input.
  53. In logic algebra, ORing means addition and ANDing means multiplication.
  54. The truth table of 3-input logic gate contains six rows.
  55. A half adder can add only half numbers.
  56. A half adder consists of one OR gate and one AND gate.
  57. A half adder has one input but two output.
  58. A full adder consists of two half address only.
  59. The outputs of a half adder are SUM and CARRY.
  60. Logical errors can be detected by compilers.
  61. Compiler convert each character into its ASCII.
  62. An object program is always free of logic errors.
  63. In FORTRAN, the first statement, DIMENSION (N), where 'N' is a non-zero positive integer, is valid.
  64. The statement GO TO is not structured element of a programming language.
  65. END is an executable statement in FORTRAN.
  66. The expression  $x = x + 1$ , although not a valid mathematical expression, is a valid FORTRAN statement.
  67. A DO loop FORTRAN must end with a CONTINUE statement.
  68. A SUBROUTINE in FORTRAN must have at least one RETURN statement.
  69. A COBAL program has four divisions.
  70. The WORKING-STORAGE SECTION is contained in the ENVIRONMENT DIVISION.
  71. The PICTURE clauses PIC 999 and PIC 9(3) are equivalent.
  72. The PICTURE clauses PIC ZZZZ, when applies to the data 0041, will produce a printed output of 41.
  73. The VALUE clause can only be used in the WORKING-STORAGE SECTION.

74. In WORKING-STORAGE, all 77-level entries must precede 01 - level descriptions of heading lines.
75. DATA DIVISION should not come after the PROCEDURE DIVISION in COBOL.
76. The first two entries in a COBOL program can be any statement.
77. The function of the IDENTIFICATION DIVISION in COBOL is to describe the equipment to be used in the program.
78. The name that follows PROGRAM-ID is the program name.
79. Two statements required to terminate a COBOL program are CLOSE and STOP THE RUN.
80. State True or False in the following: [AMIE, W'97]
- (i) One octal number may be used to represent three binary digits or bits.
  - (ii) Magnetic tape can be accessed directly (non-sequential).
  - (iii) 1 MB =  $1024 \times 1024$  bytes
  - (iv) COBOL is widely used in business applications.
  - (v) The inverse of every square matrix can be obtained.
  - (vi) Symbols S and P in a picture clause contribute to the field size.
  - (viii) VALUE clause in a COBOL program cannot be used in File-section of Data Division.
  - (ix) The variable MAX can be assigned E-format in FORTRAN program.
  - (x) Largest eigenvalue of a matrix can be determined by Power method.
81. State whether the following are true or false: [AMIE, S'98]
- (i) Seven's complement can be used for subtraction of octal numbers.
  - (ii) Biquinary code has error checking feature.
  - (iii) The following is a valid DO statement:  
DO 37 L = N(I), M
  - (iv) The following EQUIVALENCE statement is valid:  
COMMON X, Y  
EQUIVALENCE (A, X), (Y, B), (B, A)
  - (v) Laser printers are line-at-a-time non-impact printers.
  - (vi) In computer communication, baud is used to represent number of bits per second transmitted.
  - (vii) Gauss-Jordan method can be used for determining eigenvalues of matrices.
  - (viii) Milne's predictor corrector method, when used for the solution of differential equation, provides higher order of error than Runge-Kutta method.
  - (ix) GO TO statement are allowed in PL-1 language.
  - (x) In computer graphics system, when a program is meaning, the user can select action with the help of menus.
82. State true or false of the following: [AMIE, W'96]
- (i) One of the components of central processing unit is the wordprocessor.
  - (ii) The smallest portion that can be accessed by a computer on a graphics terminal is called pixel.
  - (iii) One type of floppy disk is of size 3.5".
  - (iv) WINDOWS-95 can be installed on any computer.
  - (v) DOS is a multi-user operating system.
  - (vi) Assemblers generate the object code.
  - (vii) If a matrix is singular, its inverse cannot be obtained.
  - (viii) The eigenvalues of a three-dimensional unit matrix are (0, 0, 0).
  - (ix) DIMENSION statement in FORTRAN is a non-executable statement.
  - (x) The end of a token in FORTRAN is indicated by a blank.
  - (xi) The monitor of a computer system can be an input device as well as an output device.
  - (xii) 88 level in COBOL is used for defining elementary data items in the WORKING - STORAGE SECTION.

- (xiii) Semicolon is the end-of-statement indicator in ALGOL.
  - (xiv) In a multiprocessing environment, many processes are executed at the same time.
  - (xv) BCD means binary coded decimal.
  - (xvi) TOP-down parsing means 'reading the input token until the correct structure is formed'.
  - (xvii) The result of the numerical integration of a function is necessarily the same as the result obtained by exact integration.
  - (xviii) One cannot form the transpose of a rectangular matrix.
  - (xix) A FORTRAN variable cannot contain more than six characters.
  - (xx) (1, 0, 0), (0, 1, 0), (0, 0, 1) are the eigenvectors of  $3 \times 3$  identity matrix.
83. State true or false for the following statements: [AMIE, W'95]
- (i) ASCII stands for Asian Standard Code for Information Interchange.
  - (ii) Magnetic tape system is an example of auxiliary memory system.
  - (iii) A printer may be called an input device of a computer.
  - (iv) A digital to analog (D to A) converter may be termed as an output device.
  - (v) A normalized floating point number has two parts--a mantissa and an exponent.
  - (vi) The abbreviation for Forward translation is FORTRAN.
  - (vii) A FORTRAN real variable name is formed by any combination of up to six alphabetic or numeric characters of which the first character can be any of the alphabets except A, B, C, D.
  - (viii) A process control environment demands an off line computing system.
  - (ix) Trapezoidal integration method uses equal intervals.
  - (x) With seven segment code numerals, a limited number of alphabets can be displayed.
  - (xi) EEPROM is the abbreviation for electrically equipped programmable read only memory.
  - (xii) The method of generation of control commands of the control unit of a computer by using logic circuits is known as 'microprogrammed control'.
  - (xiii) Letter quality of a dot matrix printer is usually better than that of a daisy wheel printer.
  - (xiv) A hermetically sealed hard disk system is known as Winchester.
  - (xv) A dumb VDU terminal is one in which there is a processor and some amount of memory.
84. State true or false for the following statements: [AMIE W'94]
- (i) Input data records are altered at compilation.
  - (ii) Unconditional GO TO statement is a nonexecutable statement.
  - (iii) Running out of input data records will cause a compilation error.
  - (iv) Continues statement can be placed anywhere in a program.
  - (v) The body of a loop always be processed at least once.
  - (vi) Last statement in a DO loop is normally an arithmetic assignment statement.
  - (vii) The execution of logical IF statement results in the evaluation if true or false in a logical expression.
  - (viii) Mouse increases the resolution of a graphic screen.
  - (ix) The advantage of time sharing system is faster program execution.
  - (x) The program counter checks for program error.
  - (xi) An interpreter executes one line of program.
  - (xii) Computer process instructions are not in sequential order.
  - (xiii) Fortran language has good file handling facility.
  - (xiv) floppy disks are made up of non-magnetic materials.
  - (xv) CPU consists of only memory units.
85. Explain with reasons whether the following statements are true or false:
- (i) Accessing a particular file on a magnetic tape is faster than that on a Winchester disk.
  - (ii) The 'PIC' clause in COBOL is used to draw diagrams on the screen.
  - (iii) The STOP statement in FORTRAN indicates the physical end of the program.

- (iv) BCD codes are used to represent alphabets.
  - (v) Interpreters are faster than compilers, hence the run time code is efficient for interpreter.
  - (vi) One can build a computer using CPU, RAM, I/O devices.
86. State whether the following statements are *true* or *false*: [AMIE W'93]
- (i) Computers work in finite precision whereas human being works in infinite precision.
  - (ii) Mouse increases the resolution of a graphics screen.
  - (iii) An interpreter executes one program line at a time.
  - (iv) BCD codes are used to represent alphabets.
  - (v) COMMON statement in FORTRAN helps in sharing data between a main program and a subprogram.
87. Explain which reasons whether the following statements are *true* or *false*: [AMIE, W'93]
- (i) The size of a pixel is determined by the CPU clock frequency.
  - (ii) Syntax errors are detected at the time of compilation and not during program execution.
  - (iii) The STOP statement in FORTRAN indicates the physical end of the program.
88. State *True* or *false* in the following statements: [AMIE, S'99]
- (i) The real variables in FORTRAN can be printed using only E-Format.
  - (ii) In working storage section, elementary data item should be defined at 77-level.
  - (iii) If  $\lambda$  is an eigenvalue of matrix  $A$ , then  $1/\lambda$  is an eigenvalue of  $A^{-1}$ .
  - (iv) A word on PC is equal to no byte.
  - (v) The Binary equivalent of decimal number 9 is 1001.
  - (vi) ALU is an essential component of CPU.
  - (vii) Compiler converts source code in high level language into object code in machine language.
  - (viii) 0.000587 contains six significant digits.
  - (ix) INTEREST is a valid integer variable in FORTRAN.
  - (x) The secondary memory is slower than that of main memory but has a large capacity.

### C. MATCHING TYPE

1. Match the following:
- (i) A device which works under the control of a stored program, automatically accepts and processes data to produce desired information. (a) computer
  - (ii) A set of instructions written in the language of computer (b) program
  - (iii) Hardware devices external from the central processing unit. (c) peripheral devices
  - (vi) All the electronic and mechanical elements of the computer. (d) hardware
  - (vii) Various programs which may be used on a computer system (e) software
2. Match the following:
- (i) A special storage register for storing the results of steps on a calculation of data transfer (a) minemonic
  - (ii) A program that translates high-level language into machine code. (b) accumulator
  - (iii) A program to translate a program in assembly language to machine code. (c) object program
  - (iv) Letters used to represent the decimal/binary/octal numbers representing machine code instructions (d) assembler
  - (v) Output of an assembler or compiler. (e) compiler
3. Match the following:
- (i) Simultaneous execution of two or more computer programs by a computer network. (a) object program

- (ii) A fully compiled or assembled program that is ready to be loaded into the computer. (b) object code
- (iii) Output form a computer or assembler which is itself executable machine code. (c) operating system
- (iv) Software which controls the execution of computer programs and which may provide scheduling, debugging, I/O control, etc. (d) program
- (v) A series of actions proposed in order to achieve a certain result. (e) multiprocessing
4. Match the following:
- (i) Data represented by characters. (a) significant digit
- (ii) In a numeral, a digit that must be preserved to give a given accuracy. (b) discrete data
- (iii) A binary-coded notation in which each of the binary digits is converted to decimal notation. (c) binary-coded decimal notation
- (iv) The diminished radix complement in the pure binary numeration system. (d) 2's complement
- (v) The radix complement in the pure binary numeration system. (e) 1's complement
5. Match the following:
- (i) Two or more CPUs present in a computer system and share some or all of the same memory. (a) time-sharing
- (ii) More than one program in main storage processed at the same time. (b) multiprogramming
- (iii) Job not processed till fully input. (c) real-time system
- (iv) Processor time divided into small units and each user in turn is allowed this small unit of time. (d) batch processing
- (v) Computer system capable of processing data so quickly that results are available to influence the activity currently taking place. (e) multiprocessing
6. Match the following keeping in view that in a few cases *Multiple* entries in the second column may match with *any one* entry in the first column:
- |                     |                                    |
|---------------------|------------------------------------|
| (i) Winchester Disk | (a) Group of lines                 |
| (ii) RAM            | (b) Operating System               |
| (iii) EBCDIC        | (c) Random Access Memory           |
| (iv) CPU            | (d) High-speed Memory              |
| (v) Microsoft       | (e) Formula Translation            |
| (vi) DOS            | (f) Parallel Code                  |
| (vii) ROM           | (g) Magnetic Storage Media         |
| (viii) FORTRAN      | (h) Read only Memory               |
| (ix) CACHE          | (i) Central Processing Unit        |
| (x) BUS             | (j) Computer Manufacturing Company |
|                     | (k) Mass Manufactured Silicon chip |
|                     | (l) Non-Volatile Memory            |
7. Match the following: [AMIE, W'93]
- |            |                     |
|------------|---------------------|
| (i) Disk   | (i) senucibdyctir]  |
| (ii) RAM   | (b) data processing |
| (iii) ALU  | (c) tracks          |
| (iv) ASCII | (d) character set.  |

## 8. Match the following

[AMIE, S'93]

- (i) Input unit
- (ii) Output unit
- (iii) Memory unit
- (iv) Arithmetic unit
- (v) Control unit

- (a) performs data manipulation
- (b) feeds data into the CPU
- (c) directs other units to perform specified tasks
- (e) communicates response of the computer to the user

## 9. Match the following:

[AMIE, S'97]

- (i) Disk
- (ii) RWM
- (iii) PLU
- (iv) Pentium
- (v) ASCII
- (vi) PLI
- (vii) UNIX
- (viii) Mouse

- (a) semiconductor memory
- (b) arithmetic computation
- (c) input device
- (d) microprocessor
- (e) character coding
- (f) operating system
- (g) high level language
- (h) magnetic media

## 10. Match following:

[AMIE, S'93]

- (i) FORTRAN
- (ii) ALGOL
- (iii) COBOL
- (iv) PLI

- (a) good report writing facility
- (b) suitable for both scientific and business applications
- (c) elegant language of experts algorithms
- (d) suitable for mathematical calculations.

## 11. Match the following:

[AMIE, S'93]

- (i) Branching  
p

a

r

t

- (ii) Looping

- (iii) GO TO statement

- (a) an instruction which transfers control to another of the program
- (b) A term used to describe the decision-making part of a computer program
- (c) A term used to describe a sequence of repetition in a program.

## 12. Match the following:

- (i) Rectangular shaped box
- (ii) Parallelogram shaped box
- (iii) Flat oval shaped box
- (iv) Diamond shaped box
- (v) Circular shaped box

- (a) decision symbol
- (b) terminal symbol
- (c) connection symbol
- (d) input/output symbol
- (e) assignment symbol

## 13. Match the following:

[AMIE, S'99]

- (i) Disk
- (ii) Control unit
- (iii) Array
- (iv) RWM
- (v) CD-ROM
- (vi) PLI

- (a) high level language
- (b) optical media
- (c) part of CPU
- (d) magnetic media
- (e) random access
- (f) volatile

## 14. Match the two columns and write the complete statement in each case.

- (i) FORTRAN
- (ii) Program counter
- (iii) PIC clause in COBOL
- (vi) Multiprogramming implies
- (v) Gauss method

- (a) many users using the system together
- (b) general purpose machine
- (c) determines the address of next executable instruction
- (d) semiconductor
- (e) useful for mathematics computation oriented



- |                            |   |
|----------------------------|---|
| (vi) RAM is a              | programming                               |
| (vii) Computer is a        | (f) used to specify Number Data Format    |
| (viii) Human               | (g) helps to evaluate determinant quickly |
| (ix) Decimal happens to be | (h) positional no system                  |
|                            | (i) works in infinite precision           |

**D. FILL-IN THE BLANK TYPE**

1. A computer system has four categories of devices: input devices, \_\_\_\_\_ devices, \_\_\_\_\_ devices and output devices.
2. The first electronic digital computer is the \_\_\_\_\_.
3. The second generation of computers were possible largely owing to the development of the \_\_\_\_\_.
4. The capability that differentiates computers from calculators is the \_\_\_\_\_.
5. The components of a CPU are \_\_\_\_\_, the arithmetic-logic unit, and the control unit.
6. Any hardware device that is not the CPU is often referred to as a \_\_\_\_\_.
7. \_\_\_\_\_, printers do not use physical impact to transfer characters to paper.
8. Data representation in a computer uses the \_\_\_\_\_ number system.
9. In microcomputers, the entire CPU circuitry is etched into a small piece of semiconductor materials called a(n) \_\_\_\_\_.
10. Nonnumeric data are called \_\_\_\_\_ or \_\_\_\_\_.
11. ASCII stands for \_\_\_\_\_.
12. The speed with which a personal computer operates is dependent on the speed and \_\_\_\_\_ of the microprocessor.
13. Some integrated packages split the screen of monitor into sections with each section displaying part of each standalone package. These sections are called \_\_\_\_\_.
14. \_\_\_\_\_ are a set of integrated [r]pgrs, s taje cpmtrp; tje exectopm pf compter programs and manage the storage and processing resources of a computer system.
15. In a batch mode, an operating system accepts jobs and places them in a queue to wait for execution. This process is called \_\_\_\_\_.
16. Under \_\_\_\_\_, a single program is processed by two or more CPUs.
17. \_\_\_\_\_ is a measure of the total amount of processing that a computer system can complete over a fixed period of time.
18. The most business-oriented language is \_\_\_\_\_.
19. A machine-language program is also known as \_\_\_\_\_, whereas an assembly or higher level language program is known as \_\_\_\_\_.
20. High level languages are either procedure-oriented or \_\_\_\_\_ oriented.
21. A COBOL program is divided into four major parts called \_\_\_\_\_.
22. A \_\_\_\_\_ is a set of instructions executed by the computer.
23. Fill in the blanks: [AMIE, W'94]
  - (i) Variables not starting with the letters \_\_\_\_\_ are real variables.
  - (ii) The argument of a function may be either \_\_\_\_\_ mode or \_\_\_\_\_ mode.
  - (iii) If a function has more than one argument, then the arguments may be separated by \_\_\_\_\_.
  - (iv) The \_\_\_\_\_ statement is the last statement in any program.
  - (v) The order of evaluation of an expression can be overridden by using \_\_\_\_\_.
24. Fill the blanks:
  - (i) Each specific location in main memory is designated by a number, called its \_\_\_\_\_.
  - (ii) The \_\_\_\_\_ guides the transfer of data and instructions to and from the main memory input/

output devices.

- (iii) The time required to read out the contents or to write the information into a randomly selected address in the memory is called \_\_\_\_\_.
- (iv) PL/I incorporate features of both \_\_\_\_\_ and \_\_\_\_\_.
- (v) A machine language instruction consists of two parts \_\_\_\_\_ and \_\_\_\_\_.
25. Fill in the blanks with correct of answer from the given set:
- (i) A computer is designed using four basic units, namely, input unit, output unit, processing unit, and \_\_\_\_\_.  
(arithmetic unit, memory unit, logical unit, CPU)
- (ii) In ASCII code, each character is represented by \_\_\_\_\_ bits.  
(6,7,8,10)
- (iii) A/an \_\_\_\_\_ translates a high level language program into an equivalent machine language program.  
(compiler, interpreter, operating system, register)
- (iv) In a RAM, the write time and \_\_\_\_\_ time are independent of the address of the word.  
(seek time, accesstime, latency time, search time)
- (v) The binary equivalent of the decimal number  $(90)_{10}$  is \_\_\_\_\_.
- (vi) The hexadecimal equivalent of  $(23)_{10}$  is \_\_\_\_\_.  
[ $22_{16}$ ,  $(18)_{16}$ ,  $(16)_{16}$ ]
- (vii) FORTRAN is the most popular language for engineering and scientific work, but \_\_\_\_\_ is used for business data processing.  
(ALGOL, PLI, COBOL, FORTRAN 77)
- (viii) Column 8 is referred to margin A while column \_\_\_\_\_ is referred to margin B in COBOL.  
(10, 11, 12, 13,)
- (ix) The final value of X in the following segment of FORTRAN program is \_\_\_\_\_  
 $I = 2$   
 $J = 1/2$   
 $X = J + 2$   
 $X = X + 1$   
 (6.5 8.5 6, 6.0)
- (x) Each file is assigned a name in the \_\_\_\_\_ clause in COBOL language.  
(SELECT, ASSIGN, RECORDS, PICTURE)
- (xi) Error due to finite representation of an inherently infinite data in numerical computation is known as \_\_\_\_\_ error.  
(round off, data, input, truncation)
- (xii) If one of the eigenvalues of a square matrix is 0, then the determinant of the matrix is \_\_\_\_\_.  
(not equal to 0, 0, greater than 0, less than 0)
- (xiii) The value of y at  $x = 0.1$   $dy/dx = x + y$ ,  $y(0) = 0$  using Euler's method is \_\_\_\_\_.  
(0 0.1, 0.11, 1.0)
- (xiv) The eigenvalues of the matrix  $\begin{pmatrix} 1 & 3 \\ 1 & -1 \end{pmatrix}$  are 2 and \_\_\_\_\_.  
(0, -1, -2, 1)

(xv) The inverse of the matrix  $\begin{pmatrix} 1 & 1/2 \\ 1/2 & 1 \end{pmatrix}$  is \_\_\_\_\_.

$$\left\{ \begin{pmatrix} 1 & -1/2 \\ -1/2 & 1 \end{pmatrix} \begin{pmatrix} 4/3 & -2/3 \\ -2/3 & 4/3 \end{pmatrix} \begin{pmatrix} 4/3 & 2/3 \\ 2/3 & 4/3 \end{pmatrix} \begin{pmatrix} 1 & 1/2 \\ 1/2 & 1 \end{pmatrix} \right\}$$

(xvi) In FORTRAN, END statement is an executable statement. \_\_\_\_\_  
(True or false)

(xvii) The last state of a DO loop must be a CONTINUE statement. \_\_\_\_\_  
(True or False)

(xviii) A FUNCTION subprogram returns only one value. \_\_\_\_\_  
(True or False)

(xix) The code using 8 bits per character is capable of representation characters.  
(256, 128, 64, 48)

(xx) In FORTRAN program, column 7 is reserved for continuation of a statement.  
(True or False)

## ANSWERS

## A

- |               |         |                |         |                |         |              |         |              |         |
|---------------|---------|----------------|---------|----------------|---------|--------------|---------|--------------|---------|
| 1. (b)        | 2. (b)  | 3. (e)         | 4. (a)  | 5. (d)         | 6. (c)  | 7. (c)       | 8. (c)  | 9. (d)       | 10. (c) |
| 11. (d)       | 1. (c)  | 13. (d)        | 14. (a) | 15. (c)        | 16. (c) | 17. (c)      | 18. (e) | 19. (c)      | 20. (b) |
| 21. (b)       | 22. (a) | 23. (a)        | 24. (c) | 25. (d)        | 26. (e) | 27. (e)      | 28. (c) | 29. (d)      | 30. (d) |
| 31. (c)       | 32. (b) | 33. (a)        | 34. (b) | 35. (d)        | 36. (b) | 37. (d)      | 38. (d) | 39. (d)      | 40. (d) |
| 41. (b)       | 42. (b) | 43. (a)        | 44. (a) | 45. (b)        | 46. (d) | 47. (c)      | 48. (a) | 49. (a)      | 50. (c) |
| 51. (b)       | 52. (b) | 53. (b)        | 54. (c) | 55. (b)        | 56. (e) | 57. (e)      | 58. (b) | 59. (c)      | 60. (a) |
| 61. (a)       | 62. (c) | 63. (b)        | 64. (c) | 65. (d)        | 66. (d) | 67. (a)      | 68. (b) | 69. (e)      | 70. (d) |
| 71. (b)       | 72. (c) | 73. (a)        | 74. (c) | 75. (b)        | 76. (d) | 77. (a)      | 78. (c) | 79. (i)(b)   |         |
| 79. (ii) (a)  |         | 79. (iii) (c)  |         | 79. (iv) (c)   |         | 79. (v) (c)  |         | 79. (vi) (b) |         |
| 79. (vii) (b) |         | 79. (viii) (a) |         | 79. (ix) (a)   |         | 79. (x) (c)  |         | 80. (i) (b)  |         |
| 80. (ii) (d)  |         | 80. (iii) (d)  |         | 80. (iv) (a)   |         | 80. (v) (c)  |         | 80. (vi) (d) |         |
| 80. (vii) (b) |         | 80. (viii) (a) |         | 80. (ix) (b)   |         | 80. (x) (a)  |         |              |         |
| 81. (i) (b)   |         | 81. (ii) (b)   |         | 81. (iii) (b)  |         | 81. (iv) (c) |         | 81. (v) (d)  |         |
| 81. (vi) (b)  |         | 81. (vii) (c)  |         | 81. (viii) (a) |         | 81. (ix) (b) |         | 81. (x) (d)  |         |

## B

- |             |       |              |       |             |       |            |       |             |              |
|-------------|-------|--------------|-------|-------------|-------|------------|-------|-------------|--------------|
| 1. T        | 2. F  | 3. T         | 4. F  | 5. T        | 6. T  | 7. F       | 8. F  | 9. T        | 10. F        |
| 11. F       | 12. F | 13. F        | 14. T | 15. T       | 16. T | 17. F      | 18. T | 19. T       | 20. F        |
| 21. F       | 22. F | 23. F        | 24. F | 25. F       | 26. T | 27. T      | 28. F | 29. F       | 30. T        |
| 31. F       | 32. T | 33. F        | 34. F | 35. T       | 36. T | 37. F      | 38. T | 39. T       | 40. F        |
| 41. F       | 42. F | 43. T        | 44. T | 45. F       | 46. F | 47. F      | 48. F | 49. T       | 50. F        |
| 51. T       | 52. F | 53. T        | 54. F | 55. F       | 56. T | 57. F      | 58. F | 59. T       | 60. F        |
| 61. F       | 62. F | 63. T        | 64. F | 65. T       | 66. T | 67. T      | 68. T | 69. T       | 70. F        |
| 71. T       | 72. T | 73. T        | 74. T | 75. T       | 76. F | 77. F      | 78. T | 79. F       |              |
| 80. (i) T   |       | 80. (ii) F   |       | 80. (iii) T |       | 80. (iv) T |       | 80. (v) F   | 80. (vi) F   |
| 80. (vii) T |       | 80. (viii) F |       | 80. (ix) F  |       | 80. (x) T  |       | 81. (i) T   | 81. (ii) T   |
| 81. (iii) F |       | 81. (iv) F   |       | 81. (v) F   |       | 81. (vi) F |       | 81. (vii) F | 81. (viii) T |
| 81. (ix) T  |       | 81. (x) T    |       | 82. (i) F   |       | 82. (ii) T |       | 82. (iii) T | 82. (iv) F   |

- |              |               |              |              |              |              |
|--------------|---------------|--------------|--------------|--------------|--------------|
| 82. (v) F    | 82. (vi) T    | 82. (vii) T  | 82. (viii) F | 82. (ix) T   | 82. (x) T    |
| 82. (xi) T   | 82. (xii) F   | 82. (xiii) T | 82. (xiv) T  | 82. (xv) T   | 82. (xvi) F  |
| 82. (xvii) F | 82. (xviii) F | 82. (xix) T  | 82. (xx) T   | 83. (i) F    | 83. (ii) T   |
| 83. (iii) F  | 83. (iv) T    | 83. (v) T    | 83. (vi) F   | 83. (vii) F  | 83. (viii) F |
| 83. (ix) F   | 83. (x) T     | 83. (xi) F   | 83. (xii) F  | 83. (xiii) F | 83. (xiv) T  |
| 83. (xv) F   | 84. (i) F     | 84. (ii) F   | 84. (iii) F  | 84. (iv) T   | 84. (v) F    |
| 84. (vi) F   | 84. (vii) T   | 84. (viii) F | 84. (ix) F   | 84. (x) F    | 84. (xi) T   |
| 84. (xii) F  | 84. (xiii) F  | 84. (xiv) F  | 84. (xv) F   | 85. (i) F    | 85. (ii) F   |
| 85. (iii) F  | 85. (iv) F    |              |              |              |              |
85. (v) Interpreters use run time libraries, while the code is not optimised after translation. Hence, run time code is less efficient than compiler code.
85. (vi) The computer hardware is possible but it cannot work without the resident operating system to be stored in ROM.
86. (i) T      86. (ii) F      86. (iii) T      86. (iv) F      86. (v) F
87. (i) False, because it depends upon graphic adapter technology.
87. (ii) True, because compiler is responsible for detecting syntax error.
87. (iii) False, because STOP statement indicates the stop of execution of the program and is called logical end.
- |             |              |             |            |           |            |
|-------------|--------------|-------------|------------|-----------|------------|
| 88. (i) F   | 88. (ii) T   | 88. (iii) T | 88. (iv) F | 88. (v) T | 88. (vi) T |
| 88. (vii) T | 88. (viii) F | 88. (ix) F  | 88. (x) T  |           |            |

## C

- |             |           |         |           |        |          |            |          |           |       |
|-------------|-----------|---------|-----------|--------|----------|------------|----------|-----------|-------|
| 1. (i) a    | (ii) b    | (iii) c | (iv) d    | (v) e  | 2. (i) b | (ii) e     | (iii) d  | (iv) a    | (v) c |
| 3. (i) d    | (ii) a    | (iii) b | (iv) e    | (v) d  | 4. (i) b | (ii) a     | (iii) c  | (iv) e    | (v) d |
| 5. (i) e    | (ii) b    | (iii) d | (iv) a    | (v) c  |          |            |          |           |       |
| 6. (i) g, l | (ii) c, k | (iii) f | (iv) i, k | (v) j  | (vi) b   | (vii) h, k | (viii) e | (ix) c, d | (x) a |
| 7. (i) c    | (ii) a    | (iii) b | (iv) d    |        | 8. (i) b | (ii) e     | (iii) d  | (iv) a    | (v) c |
| 9. (i) b    | (ii) a    | (iii) b | (iv) d    | (v) e  | (vi) g   | (vii) d    | (viii) c |           |       |
| 10. (i) d   | (ii) c    | (iii) a | (iv) b    |        |          |            |          |           |       |
| 11. (i) b   | (ii) c    | (iii) a | 12. (i) e | (ii) d | (iii) b  | (iv) a     | (v) c    |           |       |
| 13. (i) d   | (ii) c    | (iii) e | (iv) f    | (v) p  | (vi) a   |            |          |           |       |
| 14. (i) e   | (ii) c    | (iii) f | (iv) a    | (v)    | (vi) d   | (vii) b    | (viii) i | (ix) h    |       |

## D

- |  |                               |                     |                   |
|--|-------------------------------|---------------------|-------------------|
| 1. processing/storage                                  | 2. ENIAC                      | 3. transistor       | 4. stored program |
| 5. primary storage                                     | 6. peripheral device          | 7. nonimpact        | 8. Binary         |
| 9. chip  | 10. alphanumeric data strings |                     |                   |
| 11. American standard code for information interchange | 12. word size                 | 13. windows         |                   |
| 14. operating system                                   | 15. spooling                  | 16. multiprocessing | 17. throughput    |
| 18. COBOL  | 19. object code, source code  | 20. problem         | 21. division      |
| 22. program  |                               |                     |                   |
| 23. (i). I, J, K, L, M, N                              | (ii) value or address         | (iii) comma         | (iv) end          |
| (v) parentheses  | 24. (i) address               | (ii) I/O processor  | (iii) seek        |
| (iv) COBOL and FORTRAN                                 | (v) OP code and operands      |                     |                   |
| 25. (i) memory unit                                    | (ii) 7                        | (iii) compiler      | (iv) access time  |
| (v) 1011010  | (vi) (17) <sub>16</sub>       | (vii) COBOL         | (viii) 12         |
| (ix) 06.0  | (x) SELECT                    | (xi) Truncation     | (xii) 0           |
| (xiii) 0   | (xiv) -2                      | (xv)                | (xvi) F           |
| (xvii) F   | (xviii) T                     | (xix) 25b           | (xx) T            |

## GLOSSARY

- Absolute error.** The magnitude of the error disregarding the algebraic sign.
- Access arm.** The part of a disk drive to which all read/write heads are attached, and which moves all heads simultaneously to position them for read/write data.
- Access time.** The amount of time required to store/retrieve data between main memory and an external storage device.
- Accumulator.** A register or a set of registers in the central processor used for temporarily storing the numerical result on an operation performed by the arithmetic and logic units.
- Adder.** An electronic digital circuit to add two numbers.
- Address.** A location in memory where data are stored and can be retrieved. The part of an instruction that identifies the specific location of the data to be operated on by that instruction.
- Algol.** Acronym for ALGO<sup>R</sup>ithmic Language (a programming language). It was designed primarily for scientific-mathematical applications.
- Algorithm.** A formalised systematic procedure for problem-solving.
- Alphanumeric.** Data represented in letters of alphabet, numerals and other symbols such as punctuation or mathematical symbols.
- ALU.** The portion of the CPU used for arithmetic and logic operations.
- Analog computer.** A computer that operates on data by measuring changes in continuous physical variables such as voltage, resistance and rotation.
- AND operation.** A logical operator which has the property that if *A* and *B* are statements, then *A* and *B* are true if both statements are true; false, if either is false or both are false.
- Application software.** Programs that specify the information processing activities required for completion of specific tasks of computer users.
- ASCII.** An acronym for American Standard Code for Information Interchange. This code specifies a unique set of binary digits representing a character set.
- Assembler.** A program that translates an assembly language into the machine language.
- Assembly language.** A low level computer language consisting of symbolic instructions and addresses that translate into machine code on a one-to-one basis.
- Auxiliary storage.** Storage that supplements the primary storage of the computer.
- Bar codes.** Vertical marks/bars placed on merchandise, tags or packaging that can be sensed and read by optical character-reading devices.
- Batch processing.** Processing data in a group, or in a batch, as opposed to processing data singly in real time.
- Binary coded decimal.** A code in which each decimal digit is coded in binary form, using 4 bits for each successive digit.
- Binary.** A numbering system which uses only digits 0 and 1 to represent digits.
- Bit.** A contraction of the term Binary digit.
- Bootstrap.** An initialization program that sets up and readies the computer when it is turned on.
- Branch instruction.** A machine instruction that controls the selection of one set of instructions from a number of alternative sets during the execution of a program.
- Bus.** A set of conducting paths for movement of data and instructions that interconnects the various components.
- Byte.** An 8 bit group used to represent a single letter, number or special symbols in a computer.
- Cache.** A high-speed buffer storage area in the CPU for storing parts of a program or data during processing.

- Computer Aided Design.** The use of computer and advanced graphics hardware and software to provide interactive design assistance for engineering and architecture.
- Card punch.** A device to record information in cards by punching the holes in cards to represent letters, digits and special characters.
- Card reader.** A device which senses and translates the holes in punched cards into electrical signals.
- Cathode Ray Tube.** An electronic vacuum tube that displays the output on a computer system.
- CD-ROM.** An optical disk technology for microcomputers featuring compact disks with a storage capacity of over 500 megabytes.
- Character.** Any symbol that can be represented in a computer and displayed by it, including letters, numbers and graphic symbols.
- Character printer.** A device that prints a single character at a time.
- Chip.** A small piece of silicon or other semiconducting material containing an integrated circuit.
- Circuit.** An interconnected set of components that performs an electronic function.
- COBOL.** Common Business Oriented Language, a high level language developed for business data processing applications.
- COM.** Computer Output Microfilm, a technology that permits the output information produced by the computer to be stored in microfilm.
- Compiler.** A program that translates a high level programming language into a machine language program.
- Computer.** An electronic device with the ability to (a) accept user supplied data, (b) input, store, and execute programmed instructions, (c) perform mathematical and logic operations, and (d) output results according to user specifications.
- Control unit.** A sub-unit of the central processing unit that controls and directs the operations of the entire computer system.
- Core memory.** A device used to store information in ferrite cores.
- Cursor.** A movable marker on the display screen to assist the user in the input of data.
- Cylinder.** A vertically aligned set of tracks on each surface of magnetic disk of a disk pack, which are accessed simultaneously by the read/write heads of a disk storage device.
- Data.** A general term meaning the facts, numbers, letters and symbols processed by a computer to produce information.
- Data processing.** A general term that stands for all logical, arithmetic, and input/output operations that can be performed on data by a computer.
- Debug.** The process of detecting, locating and correcting errors in software (program) and hardware components.
- Daisywheel printer.** A serial, impact printer that uses a plastic/metal type element to create characters on paper and produces high quality typewriter quality documents.
- Digital computer.** A computer whose fundamental unit of storage is the binary digit.
- Disk.** A flat circular plate with a magnetic surface on which data can be stored.
- Disk drive.** A device consisting of one or more disks that rotate at constant high speed and also incorporates read/write heads and associated electronics.
- Disk pack.** A removable unit containing several magnetic disks that can be mounted on a magnetic disk storage unit.
- Dot matrix printers.** A serial impact printer that creates characters out of a grid or matrix of tiny dots.
- DOS.** Disk Operating System. The software that controls all operations of a disk drive.
- Double precision.** Two words used to hold one number to increase the accuracy of computed results.
- Drum printer.** A printer consisting of a large cylinder with bands of complete character sets around its circumference.
- Dumb terminal.** A computer terminal that simply acts as a medium for input and output without any processing of passing through information.
- Dynamic memory.** A type of semiconductor memory in which the presence/absence of a capacitive charge represents the state of binary storage. This charge needs periodical refreshing.

- EBCDIC.** An acronym for Extended Binary Coded Decimal Interchange Code. An 8-bit code designed by IBM that assigns binary digits to specific symbols.
- EPROM.** An Erasable Programmable Read Only Memory that can be erased and programmed with special devices.
- EROM.** Erasable Read Only Memory. A type of read only memory that can be erased by exposure to ultraviolet light.
- Error.** A discrepancy between a computed, observed or measured value and the true, specified or theoretically correct value.
- Execution time.** The portion of one machine cycle needed by CPU's supervisory control unit to execute an instruction.
- Fixed point number.** A number represented, manipulated and stored with the decimal point in a fixed position.
- Floating point number.** A number with significant digits to the right of the decimal point in base and exponent form.
- Floppy disk.** A flexible mylar disk often used as secondary storage, and commonly called a diskette.
- Flow chart.** A graphical representation of processing steps in which symbols are used to represent operations, data, flow, logic, equipment and so on.
- FORTRAN.** FORmula TRANslation. A high level programming language widely used for scientific and engineering applications.
- General-purpose computer.** A computer designed to handle a wide variety of problems.
- Graphics terminal.** A terminal with the ability to produce pictures, line drawings, graphs, charts and pictorial displays.
- Half adder.** A logic circuit that adds 2 bits.
- Hard copy.** Computer output printed on paper.
- Hard disk.** A type of secondary storage medium with one or more rigid platters mounted on a common spindle.
- Hardware.** The physical devices of a computer system, e.g., keyboard, printer, monitor.
- Hexadecimal system.** The number system with base 16. The digits are 0-9, A-F.
- High level language.** A programming language, that is machine independent and closely resembles with human language.
- Host computer.** A larger central computer that performs the major data processing tasks in a computer network.
- Hybrid computer.** A computer having features of both analog and digital computers.
- Impact printer.** A printer which creates characters by physically striking a ribbon and paper.
- Information.** Information is data placed in meaningful and useful context for an end-user.
- Initialize.** To set counters, contents of storage locations, variables, etc., to an initial value which may be zero or some other specified value.
- Inkjet printer.** A printer that uses a selected pattern of dots to form images that are transferred by spraying droplets of ink.
- Instruction.** A basic unit of a program that specifies what action is to be performed on what data.
- Instruction register.** A register when instruction fetched from memory are stored while being executed.
- Integrated circuit.** A system of interrelated circuits packaged together on a single silicon chip.
- Intelligent terminal.** A terminal with capabilities of a microcomputer or minicomputer, which can thus perform many data processing and other functions without accessing a central computer.
- Inter block gap.** The empty space on a magnetic device used to separate block records.
- Interpreter.** A program that translates and executes each source language statement before translating and executing the next instruction.
- Inter record gap.** A space on a magnetic device used to separate physical file records from one another.
- Joystick.** An input device for generating signals that can cause the cursor to be moved on a display screen.
- Keyboard.** A type of input device operated by depressing alphanumeric keys.

- Key-to-disk.** Data entry using a keyboard device to record data directly on to a magnetic disk.
- Kilo byte.** A unit of measure of storage capacity equal to 1024 bytes.
- Least significant bit.** In a binary number, it is the bit at the extreme right hand of the number.
- Large scale integration.** Memory chips that contain thousands of electronic circuits.
- Laser printer.** A page-at-a-time printer that utilises a laser beam to print on a paper.
- Light pen.** A hand-held, light-sensitive device that allows a user to point to or write information on a display screen.
- Loop.** A process in a program executed repeatedly by the computer until a certain condition is satisfied.
- Machine cycle.** The length of time required to interpret and to process one instruction.
- Magnetic ink character recognition.** A type of data input that uses machine readable ink containing magnetic particles. Primarily used for check processing by the banking industry.
- Mainframe computer.** A large-size computer system with a separate central processing unit with substantial processing capabilities, the ability to attach numerous peripheral devices, and data communication capabilities.
- Megabyte.** One million bytes of computer storage.
- Memory.** A component of a computer system that stores programs and data while waiting to be processed by CPU.
- Microcomputer.** A computer system based on a microprocessor as the central processing unit.
- Microfiche.** Small film sheets that store information in miniaturized form.
- Microfilm.** A roll of film that is used to store images of documents in miniature.
- Microprocessor.** The central processing unit implemented on an integrated circuit chip or set of chips.
- Minicomputer.** A computer that is larger than a microcomputer and less powerful than mainframe computer.
- Monochrome.** Involving only one colour.
- Most significant bit.** It is the bit on the extreme left or the adjacent bit if extreme bit is used as a sign bit.
- Mouse.** A device to control cursor movement on a display screen. It is commonly used to draw figures or point to menu choices on a CRT screen.
- MS-DOS.** A disk operating system developed for microcomputers by Microsoft, Inc. that resides on a floppy disk instead of primary memory.
- Multiplexer.** An electronic device that allows a single communication channel to carry simultaneous data transmission from any terminal.
- Multiprogramming.** Concurrent running of two or more programs on a single processor by interleaving or overlapping their execution.
- Multitasking.** Running of two or more programs on a single processor.
- Nibble.** A unit of four bits.
- Non-impact printer.** A printer that prints without a striking mechanism through electrostatic, thermal, laser and other non-impact means.
- Object program.** It is the machine code program understood by computer and is prepared by translating the source program by an assembler or by a compiler.
- OCR.** An acronym for Optical Character Recognition. A process of scanning a printed image and reading the symbols, translating them into computer readable form.
- Octal system.** A number system of base 8 using digits 0 through 7.
- Operand.** It refers to the entity operated upon. The operand of an instruction is the part of the instruction which, depending upon the addressing mode, is either the data itself or specifies where the data is.
- Operating system.** A set of programs that control the execution of computer programs and may provide scheduling, debugging, storage assignment, data management and related service.
- Optical scanner.** A device that optically scans characters/images and generates their digital representations.



- Parallel processing.** The ability of a computer to execute several instructions in parallel.
- Pixel.** The smallest accessible area of the screen that can be controlled by the hardware.
- PL/1.** A procedure oriented, high-level, general purpose programming language designed to combine the features of COBOL, FORTRAN and ALGOL.
- Plotter.** A device that produces an image by controlling the motion of a pen carriage.
- Plot-of-sale terminal.** A computer terminal stores in retail and serves the function of a cash register as well as collecting sales data and performing other data processing functions.
- Printer.** A device that produces hard copy output from a computer system by transferring an image on to paper.
- Program.** A set of instructions defining sequential activities/operations to be performed by a computer to solve a problem.
- Program counter.** A register within the CPU which holds the address of the memory location containing the next instruction to be executed.
- PROM.** Programmable Read Only Memory. An integrated memory circuit that once written with data, cannot be erased.
- Punched card.** A card punched with a pattern of holes to represent data.
- Punched tape.** A tape on which a pattern of holes or cuts is used to represent data.
- Radix.** The base number in a number system, i.e., the radix in decimal system is 10.
- Random access memory.** The memory used for temporary storage of data or program which can be directly accessed in the same length of time, irrespective of its location on the storage medium.
- Raster scan.** The generating of images on a screen by focusing an electronic beam on phosphor-coated screen.
- Real time processing.** The processing of data immediately after it has been entered in a computer system.
- Register.** A device capable of storing a specified small amount of data.
- Read only memory.** Primary memory used to store data and instructions that cannot be changed by the user.
- Search time.** The time required to rotate the needed record under the read/write head of magnetic disk.
- Secondary storage.** A mass storage media where data and programs are stored when they are not required during execution.
- Sector.** A sub-division of a track on a magnetic disk surface.
- Seek time.** The time required to position the read/write head over the proper track on a magnetic disk.
- Semiconductor storage.** A memory device whose storage elements are formed as solid-state electronic components on an integrated circuit chip.
- Significant digit.** It is a digit which contributes to the precision of a number.
- Software.** Programs and procedures concerned with the operation of a computer system.
- Source program.** A program written in a language subject to a translation process.
- Special-purpose computer.** A computer designed to handle a restricted class of problems.
- Structured programming.** A programming methodology that uses a top-down program design and a limited number of control structures in a program.
- Subroutine.** A frequently required routine or program segment. Such program segment instead of being rewritten at several points within a program, is written just once as a routine that can be called at each of these points.
- Supercomputer.** Computer systems characterised by their huge primary memory and most advanced processing capabilities.
- Tape drive.** A device used to read from and write to magnetic tapes.
- Terminal.** A device used in communication systems to enter or receive data.
- Thermal printer.** A printer using a selected pattern of dots to form images that are transferred by heat on to specially coated paper.
- Time-sharing.** A method that allows multiple users of a computer system to share the computer, giving the illusion of having simultaneous access.

- Track (on magnetic disk).** An invisible concentric ring on a disk platter used to store data.
- Track (on magnetic tape).** An invisible channel running lengthwise along a magnetic tape used to store data.
- Track ball.** A roller ball device used to move the cursor on a display screen.
- Turnaround time.** The elapsed time between submission of a job to a computing centre and the return of results.
- Utility program.** A standard set of routines that assists in the operation of a computer system by performing some frequently required process such as sorting or merging.
- Visual display terminal.** A terminal that displays output on a display screen such as CRT screen, LCD screen.
- Volatile memory.** A memory that loses its information when electric power supply is turned-off.
- Virtual memory.** A technique for storing programs or data on auxiliary storage and making them appear to be in primary storage by swapping pages or segments in and out of primary storage when needed.
- Word.** A number of bits in a sequence that is treated as a unit and is stored in one memory location.
- Winchester disk.** A high-speed sealed medium to large capacity magnetic storage medium for computer systems.
- Window.** A rectangular area which covers a finite region of the picture in WCS, on the display screen.

## BIBLIOGRAPHY

- Alam, S. S. and Sen, S.K., *Computer and Computing with Fortran 77*, Oxford & IBH Publishing Co. Ltd., New Delhi, 1988.
- Asthana, R.G.S. and Sinha, N.K., *Computer Graphics for Scientists and Engineers*. New Age International (P) Ltd., New Delhi, 1996.
- Barners, R.A., *PL/1 for Programmers*. North-Holland Publishing Co., 1979.
- Bartee, T.C., *Digital Computer Fundamentals*. McGraw Hill, New York, 1985.
- Bloom, E.P., *COBOL Language of Business*. BPB Publications, New Delhi, 1987.
- Dhaliwal, R.S., Kumar, S. and Gupta, S.K., *Programming with FORTRAN 77: A Structured Approach*. Wiley Eastern Ltd., New Delhi, 1989.
- Dhamdhare, D.M., *Introduction of System Software*. Tata McGraw-Hill Publishing Co., New Delhi, 1986.
- Gupta, A.K., *Engineering Mathematics—Vols I and II*. Macmillan India Ltd., New Delhi, 1992.
- Gupta, A.K. and Sarkar, S.K., *Systems Analysis, Data Processing and Quantitative Techniques*. Galgotia Publications (P) Ltd., New Delhi, 1997.
- Hammond, R.H., Rogers, W.B. and Crittenden, J.B., *Introduction to Fortran 77 and the Personal Computer*, McGraw-Hill International Edition, New York, 1987.
- Jain, M.K., Iyenger, S.R.K. and Jain, R.K., *Numerical Methods for Scientific and Engineering Computation*. New Age International (P) Ltd., New Delhi, 1989.
- Jain, R.K. and Suri, R.P., *FORTAN 77 with Applications to Science and Engineering*. Tata McGraw-Hill Publishing Co. Ltd., New Delhi, 1993.
- Jain, Satish., *0-Level Examination Module-1-Computer Fundamentals*. BPB Publications, New Delhi, 1994.
- Kapoor, V.K., *Fundamentals of Electronic Data Processing*. Sultan Chand and Sons, New Delhi, 1995.
- Malvino, A. P. and Leach, D.P., *Digital Principles and Applications*. Tata McGraw-Hill Publishing Co. Ltd., New Delhi, 1981.
- Mano, M.M., *Digital Logic and Computer Design*. Prentice Hall of India (P) Ltd., New Delhi, 1986.
- Mendelson, E., *Boolean Algebra and Switching Circuits*. Schaum's Outline Series, McGraw-Hill Book Co., New York, 1973.
- Mukherjee, K.K., *Numerical Analysis*. New Central Book Agency, Calcutta, 1990.
- Nicol Keith, *Elementary Programming and ALGOL*. McGraw-Hill Book Company, New York, 1965.
- Plastock, R.A. and Kalley, G., *Theory and Problems of Computer Graphics*. Schaum's Outline Series, International Edition, 1986.
- Rajaraman, D. and Rajaraman, V., *Computer Primer*. Prentice Hall of India (P) Ltd., New Delhi, 1986.
- Rajaraman, V., *Computer-oriented Numerical Analysis*. Prentice Hall of India (P) Ltd., New Delhi, 1980.
- Rajaraman, V., *Fundamentals of Computer*. Prentice Hall of India (P) Ltd., New Delhi, 1989.
- Ram, B., *Computer Fundamentals, Architecture and Organisation*. New Age International (P) Ltd., New Delhi, 1995.
- Rogers, D.F., *Procedural Elements of Computer Graphics*. McGraw Hill Book Co, International Edition, New York, 1985.

- Rogers, D.F. and Adams, A.J., *Mathematical Elements for Computer Graphics*. McGraw Hill International Edition, New York, 1989.
- Roy, M.K. and Ghosh Dastidar, D., *COBOL Programming*. Tata McGraw Hill Publishing Co Ltd., New Delhi, 1991.
- Salaria, R.R., *Numerical Methods : A Computer-oriented Approach*. BPB Publications, New Delhi, 1996.
- Sanders, D.H., *Computer Today*. McGraw-Hill Book Company, McGraw Hill, 1988.
- Sastry, S.S. *Introductory Methods of Numerical Analysis*. Prentice Hall of India (P) Ltd., New Delhi, 1981.
- Simkim, M.G., *Introduction to Computer Information System for Business*. S. Chand & Company Ltd., New Delhi, 1995.
- Stern Nancy and Stern, R.A., *Structured COBOL Programming*. John Wiley & Sons, New York, 1988.
- Tocci, R.J., *Digital System Principles and Applications*. Prentice Hall of India (P) Ltd., New Delhi, 1996.
- Virendra Kumar., *Digital Technology : Principles and Applications*. New Age International (P) Ltd., 1995.
- Worth, Thomas., *COBOL for Beginners*. Prentice Hall of India (P) Ltd., New Delhi, 1992.
- Xavier, C., *FORTRAN 77 and Numerical Methods*. New Age International (P) Ltd., New Delhi, 1995.

## COMMONLY USED ABBREVIATIONS

A large number of abbreviations commonly used by computer professionals/students are given to make their task simpler.

ABC	—	Atanasoff Berry Computer
ACIA	—	Asynchronous Communications Interface Adapter
ACK	—	Acknowledge character
ACU	—	Automatic Calling Unit
ADC	—	Analog to Digital Converter
ADCCP	—	Advanced Data Communication Control Procedure
ADP	—	Automatic Data Processing
AED	—	Algebraic Extended for Design
AFL	—	Abstract Family of Languages
AHPL	—	A Hardware Programming Language
AI	—	Artificial Intelligence
ALGOL	—	Algorithmic Language
ALU	—	Arithmetic/Logic Unit
AM	—	Amplitude Modulation
AMT	—	Active Memory Technology
ANSI	—	American National Standards Institute
AP	—	Attached Processor
APL	—	A Programming Language
APS	—	Ada Programming Support
APT	—	Automatically Programmed Tools
ARMA	—	Auto Regressive Moving Average
ASCAC	—	Automatic Sequence Controlled Calculator
ASCII	—	American Standard Code for Information Interchange
ASK	—	Amplitude Shift Keying
ATDM	—	Asynchronous Time Division Multiplexing
ATL	—	Automated Tape Library
AU	—	Arithmetic Unit
BASIC	—	Beginners All-purpose Symbolic Instruction Code
BCD	—	Binary Coded Decimal
BDOS	—	Basic Disc Operating System
BSC	—	Binary Synchronous Communication
BD	—	Binary Digit
BMC	—	Bubble Memory Control
BNF	—	Backus Normal Form
BTM	—	Beginning of Tape Marker
BI	—	Bits per inch
BPS	—	Bits per second
BSAM	—	Basic Sequential Access Method
BSC	—	Binary Symmetric Channel/Binary Synchronous Communication

C	—	A systems programming language
CAD	—	Computer Aided Design
CAE	—	Computer Aided Engineering
CAFS	—	Contents Addressable File Store
CAI	—	Computer Aided Instructions
CAL	—	Computer Aided Learning
CAM	—	Content Addressable Memory (also Computer Aided Machining/ Computer Aided Manufacturing)
CASE	—	Computer Aided Software Engineering
CASS	—	Computer Assisted Stereotaxic Surgery
CAT	—	Computer Aided Testing (also Computer Axial Tomography)
CBL	—	Computer Based Learning
CCD	—	Charge Coupled Device
CCITT	—	Consultative Committee on International Telephones and Telegraph (an organisation with representatives from PTIs around the world)
CDAC	—	Centre for Development of Advanced Computing
CDL	—	Computer Description Language
CD-ROM	—	Compact Disc-ROM
CGM	—	Computer Graphics Metafile
CHDL	—	Computer Hardware Description Language
CICS	—	Computer Information Control System
CIM	—	Computer Input Microfilm
CIR	—	Current Instruction Register
CISC	—	Complex Instruction Set Computing
CIS-COBOL	—	Compact Interactive Standard COBOL
CLIP	—	Coded Language Information Processing
CMJ	—	Computer Managed Instructions
CML	—	Circuit Mode Logic
CMOS	—	Complementary Metal Oxide Silicon
CNF	—	Conjunctive Normal Form
COBOL	—	Common Business Oriented Language
CODASYL	—	Conference on Data System Language
CODEC	—	Coder Decoder
COM	—	Computer Output Microfilm/Microfiche
COMAL	—	Common Algorithmic Language
CORAL	—	Class Oriented Ring Associated Language
CP	—	Central Processor
CPL	—	Combined Programming Language
CPM	—	Control Program for Microprocessor (Carnegie Park Method)
CPU	—	Central Processing Unit
CRC	—	Cyclic Redundancy Check
CRT	—	Cathode Ray Tube
CS	—	Chip Select
CSMA	—	Carrier Sense Multiple Access
CU	—	Control Unit
CUE	—	Computer Using Educators
DAC	—	Digital to Analog Converter
DAP	—	Distributed Array of Processors
DASD	—	Direct Access Storage Device
DAT	—	Dynamic Address Translation

<b>DBMS</b>	—	Data Base Management System
<b>DCB</b>	—	Data Control Block
<b>DCE</b>	—	Data Communication Equipment
<b>DD/D</b>	—	Data Dictionary /Director
<b>DDA</b>	—	Digital Differential Analyzers
<b>DDC</b>	—	Direct Digital Control
<b>DDI</b>	—	Direct Distance Dialling
<b>DDP</b>	—	Direct Data Entry
<b>DDL</b>	—	Data Definition Language or Data Description Language
<b>DDP</b>	—	Distributed Data Processing
<b>DES</b>	—	Data Encryption Standard
<b>DIL or DIP</b>	—	Dual-in-Line Package
<b>DIM</b>	—	Dimension
<b>DLC</b>	—	Data Link Control
<b>DMA</b>	—	Direct Memory Access
<b>DME</b>	—	Direct Machine Environment
<b>DML</b>	—	Data Manipulation Language
<b>DNC</b>	—	Direct Numerical Control
<b>DOS</b>	—	Disk Operating System
<b>DP</b>	—	Data Processing
<b>DPCM</b>	—	Differential Pulse Code Modulation
<b>DPM</b>	—	Data Processing Manager
<b>DPMI</b>	—	DOS Protected Mode Interface
<b>DPU</b>	—	Display Processing Unit
<b>DRO</b>	—	Destructive Read Out
<b>DSL</b>	—	Data Set Label
<b>DSN</b>	—	Data Set Name
<b>DSS</b>	—	Decision Support System
<b>DTE</b>	—	Data Terminal Equipment
<b>DTL</b>	—	Diode Transistor Logic
<b>DTP</b>	—	Desk Top Publishing
<b>EAROM</b>	—	Electrically Alterable Read Only Memory
<b>EBAM</b>	—	Electron Beam Addressed Memory
<b>EBCDIC</b>	—	Extended Binary Coded Decimal Interchange Code
<b>EBNF</b>	—	Extended Backus Normal Form
<b>ECG</b>	—	Echo Cardiography
<b>ECL</b>	—	Emitter Coupled Logic
<b>ECMA</b>	—	European Computer Manufacture's Association
<b>ECOM</b>	—	Electronic Computer Oriented Mail
<b>EDI</b>	—	Electronic Data Interchange
<b>EDP</b>	—	Electronic Data Processing
<b>EDS</b>	—	Exchangeable Disk Store
<b>EDSAC</b>	—	Electronic Delay Storage Automatic Calculator
<b>EDVAC</b>	—	Electronic Discrete Variable Automatic Calculator
<b>EEG</b>	—	Electro Encephalography
<b>EEROM</b>	—	Electrically Erasable ROM
<b>EFTS</b>	—	Electronic Funds Transfer System
<b>EISA</b>	—	Extended Industry Standard Architecture
<b>ENIAC</b>	—	Electronic Numerical Integrator and Calculator
<b>EOB</b>	—	End of Block

EOD	—	End of Data
EOF	—	End of File
EOJ	—	End of Job
EOM	—	End of Message
EOR	—	End of Record
EOT	—	End of Transmission
EPROM	—	Erasable Programmable Read Only Memory
EVFU	—	Electronic Vertical Format Unit
FAT	—	File Allocation Table
FB	—	Frame Buffer
FDM	—	Frequency Division Multiplexing
FEP	—	Front End Processor
FET	—	Field Effect Transistor
FF	—	Flip Flop
FFT	—	First Fourier Transforms
FGCS	—	Fifth Generation Computer System
4GL	—	Fourth Generation Language
FIFO	—	First-In-First-Out
FLOM	—	Floating point Operations per Second
FM	—	Frequency Modulation
FORTRAN	—	Formula Translator Language
FPLA	—	Field Programmable Logic Array
FSA	—	Finite State Automation
FSK	—	Frequency Shift Keying
GB	—	Giga Byte
GCR	—	Group Code Recording
GIGO	—	Garbage In/Garbage Out
GINO	—	Graphical Input Output
GKS	—	Graphics Kernel System
GPIB	—	General Purpose Interface Bus
GUI	—	Graphical User Interface
HDLC	—	High-level Data Link Control
HMOS	—	High Speed MOS
HPF	—	Highest Priority First
IAL	—	International Algorithmic Language
IAR	—	Instruction Address Register
IAS	—	Immediate Access Storage
IBG	—	Inter Block Gap
IC	—	Integrated Circuit
ICAI	—	Intelligent Computer Assisted Instructions
ICG	—	Interactive Computer Graphics
IDP	—	Integrated Data Processing
IDPN	—	Integrated Digital Packet Network
IFIP	—	International Federation for Information Processing
IH	—	Interrupt Handler
IIL	—	Integrated Injection Logic
IML	—	Initial Microcode Load
IMP	—	Interface Message Processor
I/O	—	Input/Output
IOC	—	Input Output Controller



IOCS	—	Input Output Control System
IOP	—	I/O Processor—also Information Processing Language
IP	—	Internet Protocol
ips	—	Instructions per second
IR	—	Instruction Register
IRG	—	Inter Record Gap
ISAM	—	Indexed Sequential Access Method
ISDN	—	Integrated Services Digital Network
ISFET	—	Ion Selective Field Effect Transistor
ISR	—	Information Storage and Retrieval
IT	—	Information Technology
JCL	—	Job Control Language
JOSS	—	Johnniac Open Shop System
JOVIAL	—	Joules' Own Version of International Algorithm Language
K	—	Kilo (1024 or $2^{10}$ )
KB	—	Kilobyte ( $2^{10}$ or 1024)
KBS	—	Kilobyte per Second
KIPS	—	Kilo Instructions Per Second
LAN	—	Local Area Network
LAP	—	Link Access Protocol
LBA	—	Linear Bounded Automation
LCD	—	Liquid Crystal Display
LDL	—	Language Description Language
LED	—	Light Emitting Diode
LIFO	—	Last-In-First-Out
LIPS	—	Logical Inferences Per Second
LISP	—	List Processing
LPM	—	Lines Per Minute
LPS	—	Lines per Second
LRC	—	Longitudinal Redundancy Check
LSB	—	Least Significant Bit
LSD	—	Least Significant Digit
LSI	—	Large Scale Integration
MAC	—	Machine Aided Cognition
MAP	—	Manufacturing Automation Protocol
MAR	—	Memory Address Register
MDR	—	Memory Data Register
MDS	—	Microcomputer Development System
MFM	—	Modified Frequency Modulation
MICR	—	Magnetic Ink Character Recognition
MIMD	—	Multiple Instruction Multiple Data Stream
MIMDP	—	Multiple Instruction, Multiple Data Processor
MIPS	—	Million Instructions Per Second
MIS	—	Management Information System
MISDP	—	Multiple Instruction, Single Data Processor
MOHLL	—	Machine Oriented High Level Language
MOS	—	Metal Oxide Semiconductor
MOSFET	—	Metal Oxide Silicon Field Effect Transistor
MOST	—	Metal Oxide Semiconductor Transistor
MPU	—	Microprocessor Unit

## Commonly Used Abbreviations

MSI	—	Medium Scale Integration
MTS	—	Michigan Terminal System
MTU	—	Magnetic Tape Unit (Merged Transistor Logic)
MVNP	—	Multiprogramming with a Variable Number of Processor—An Operating System
MVS	—	Multiple Virtual Storage
NACK	—	Negative Acknowledgement
NBCD	—	National Binary Coded Decimal
NCM (or n/d)	—	Numerical Control Machine
NCC	—	National Computing Centre
NCP	—	Network Control Protocol
NDRO	—	Non-destructive Read Out
NEG	—	Non-equivalence Gate
NIFTP	—	Network Independent File Transfer Protocol
NMOS	—	N-type MOS
NRZ	—	Non Return to Zero
NRZI	—	Non Return to Zero Inverted
ns	—	Nanosecond
NVRAM	—	Non-volatile Random Access Memory
OCR	—	Optical Character Recognition
ODA	—	Open Document Architecture
OEM	—	Original/Other Equipment Manufacturer
OLQ	—	One Line Query
OLTD	—	On-Line Transaction Despatch
OLTP	—	On-Line Transaction Processing
OMR	—	Optical Mark Reading
OOF	—	Office of the Future
OOP	—	Object Oriented Programming
ops	—	operations per second
OS	—	Operating System
OSI	—	Open System Interconnection
PABX	—	Private Automatic Branch Exchange
PACS	—	Picture Archiving and Communication System
PAD	—	Packet Assembler/Disassembler
PAL	—	Phase Alternation Line
PAR	—	Positive Acknowledgement and Transmission
PBX	—	Private Branch Exchange
PCB	—	Printed Circuit Board
PCM	—	Pulse Code Modulation
PDA	—	Push Down Automation
PDL	—	Program Design Language
PDM	—	Pulse Division Modulation
PE	—	Phase Encoded
PET	—	Positive Emission Tomography
PHIGS	—	Programmer's Hierarchical Interactive Graphic Systems
PIA	—	Peripheral Interface Adapter
PIN	—	Personal Identification Number
PIC	—	Parallel Input/Output
PIPO	—	Parallel In Parallel Out
PISO	—	Parallel In Serial Out

PLA	— Programmable Logic Array
PL/M	— Programming Language for Microcomputers
PL1	— Programming Language 1
PM	— Phase Modulation
PMOS	— P-type MOS
POL	— Problem Oriented Language
PoS	— Point of Sale
PPM	— Pulse Position Modulation
PPU	— Peripheral Processing Unit
PROLOG	— PROgramming of LOGic
PROM	— Programmable Read Only Memory
PSL/PSA	— Problem Statement Language/Problem Statement Analyser
PSS	— Packed Switched Service
PSW	— Processor Status Word
QBE	— Query By Example
QISAM	— Queued Indexed Sequential Access Method
QL	— Query Language
RAM	— Random Access Memory
RCS	— Realtime Communication System
RDBMS	— Relational Database Management System
RISC	— Reduced Instruction Set Computer
RJE	— Remote Job Entry
ROM	— Read Only Memory
ROVs	— Remotely Operated Vehicles
RPG	— Report Program Generator
RPN	— Reverse Polish Notation
RTL	— Real Time Language (Register-Transistor Logic)
SADT	— Structured Analysis and Design Technique
SAM	— Sequential Access Method
SCL	— System Control Language
SCR	— Silicon Controlled Rectifier
SDLCL	— Synchronous Data Link Control/Systems Development Life Cycle
SEAC	— Standard Eastern Automatic Computer
SIMD	— Single Instruction Multiple Data System
SIMDP	— Single Instruction, Multiple Data Processor
SIMULA	— Simulation Language
SIO	— Serial Input/Output
SIPO	— Serial In Parallel Output
SISDP	— Single Instruction Single Data Processor
SISO	— Serial In Serial Out
SNA	— System Network Architecture
SNOBOL	— String Oriented Symbolic Language
SOM	— Start of Message
SOP	— Standard Operating Procedure
SOS	— Silicon On Sapphire
SP	— Stack Pointer
SPECT	— Single Photon Emission Computer Tomography
SQA	— Software Quality Assurance
SQL	— Structured Query Language
SSI	— Small Scale Integration

SSM	—	Spread Spectrum Modulation
TCB	—	Task Control Block
TCP	—	Transmission Control Protocol
TDM	—	Time Division Multiplexing
TELNET	—	Teletype Network
TIP	—	Terminal Interface Processor
tips	—	thousands of instructions per second
TLU	—	Table Look Up
TOPS	—	Terminal Operating System
TOS	—	Tape Operating System
TP	—	Transaction Processing
TPT	—	Throughput Time
TTL	—	Transistor-Transistor Logic
UART	—	Universal Asynchronous Receiver/Transmitter
ULA	—	Uncommitted Logic Array
ULE	—	Uncommitted Logic Error
ULSI	—	Ultra Large Scale Integration
UNIVAC	—	Universal Automatic Computer
UPC	—	Universal Product Code
UVEPROM	—	Ultra Violet-Light Erasable Programmable Read Only Memory
VAB	—	Voice Analog Back
VAM	—	Vision Aided Manufacturing
VANS	—	Value Added Network Services
VCPI	—	Virtual Control Program Interface
VDT	—	Visual Display Terminal
VDU	—	Visual Display Unit
VESDA	—	Very Early Smoke Detection Apparatus
VFU	—	Vertical Format Unit
VLDB	—	Very Large Data Base
VLSI	—	Very Large Scale Integration
VM/CMS	—	Virtual Machine/Conversational Monitor System
VRC	—	Visible Record Computer/Vertical Redundancy Check
VS	—	Virtual Storage
VSAM	—	Virtual Storage Access Method
WAN	—	Wide Area Network
WCS	—	Writable Control Store
WISS	—	Workstation Independent Segment Storage
WP	—	Word Processing
WPP	—	Word Processing Program
YACC	—	Yet Another Complex Compiler
Z	—	Zero bit