CHAPTER

01

INTRODUCTION TO COMPUTER

The word 'computer' has been derived from the Latin word 'computare', which means 'to calculate'. A computer is an electronic device that manipulates information or data according to the set of instructions called **programs**. It has the ability to store, retrieve and process data.

Functions of Computer

1. **Input** Information or data that is entered into a computer is called input. It sends data and instructions to the Central Processing Unit (CPU).
2. **Processing** It is the sequence of actions taken on data to convert it into information which is meaningful to the user. It can be calculations, comparisons or decisions taken by the computer.
3. **Output** It makes processed data available to the user. It is mainly used to display the desired result to the user as per input instructions.
4. **Storage** It stores data and programs permanently. It is used to store information during the time of program execution and possible to get any type of information from it.

Features of Computer

1. **Speed** The computer can process data very fast at the rate of millions of instructions per second.
2. **Accuracy** Computers provide a high degree of accuracy. They respond to the user as per the input instructions.
3. **Storage Capacity** Computers are capable to store huge amount of data, which depends on the capacity of hard disk.
4. **Versatility** Computers can do different types of work simultaneously. They can perform multiple tasks at a same time.
5. **Diligence** Unlike human beings, a computer is free from monotony, tiredness, lack of concentration, etc., and can work for hours without creating any errors.

6. **Secrecy** Leakage of information is reduced by creating login system with password protection.
7. **Reliability** Computers are more reliable than human beings. Computers always produce exact results. The possibility of errors occur only if the input is wrong, i.e. the computers never make mistakes of their own accord.
8. **Plug and Play** Computers have the ability to automatically configure a new hardware and software components.

History of Computer

Computer is not the creation of one day, rather it took a long period for the development of modern computer.

History of computer is described in this table

Inventions	Inventors	Characteristics	Applications
Abacus **1602**	China	▪ First mechanical calculating device. ▪ A horizontal rod represents the one, tens, hundred, etc.	▪ Used for addition and subtraction operations. ▪ Calculation of square roots can also be performed.
Napier's Bones **1617**	John Napier (Scotland)	▪ Three dimensional structure. ▪ Holding numbers from 0 to 9 only. ▪ Represent graphical structure of calculating result. ▪ Technology used for calculation called **Rabdologia**.	▪ Perform multiplication of numbers.
Pascaline **1642**	Blaise Pascal (France)	▪ First mechanical adding machine. ▪ This machine worked on the principle of odometer and watch. ▪ Mainly designed with regard to the pressure of liquid.	▪ Perform addition and subtraction of two numbers.
Jacquard's Loom **1801**	Joseph Marie Jacquard (France)	▪ It was first mechanical loom. ▪ Used punched card for the sequence of operation.	▪ Simplified the process of textiles.
Analytical Engine **1837**	Charles Babbage (London)	▪ First general-purpose computer. ▪ Stored program in the form of 'pegs' also called **barrels.**	▪ It was a decimal machine used sign and magnitude for representation of a number.
Tabulating Machine **1890**	Herman Hollerith (America)	▪ It used punched cards for reading numbers. ▪ It was the first electromechanical machine.	▪ It was used in the 1890 census.
MARK-1 **1944**	Howard Aiken (America)	▪ Consists of interlocking panels of small glass, counters, switches and control circuits. ▪ Data can be entered manually.	▪ Mainly used in the war effort during World War-II. ▪ Magnetic drums are used for storage.
ENIAC **1946**	JP Eckert and JW Mauchly (America)	▪ It is a combination of twenty accumulators. ▪ First electronic digital computer.	▪ Used for weather prediction, atomic energy calculation and other scientific uses. ▪ Used in IBM and other.

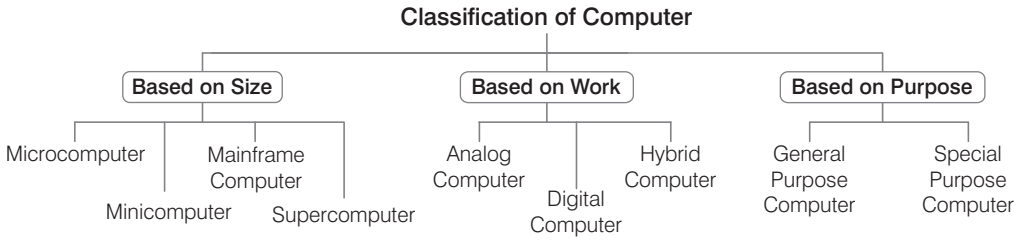
Inventions	Inventors	Characteristics	Applications
EDVAC **1947**	John Von Neumann (America)	▪ Electronic digital computer	▪ Logical design of a computer with a stored program.
EDSAC **1949**	Maurice Wilkes (America)	▪ It was the first computer which provided **storage capacity.** ▪ First computer program was run on machine.	▪ Capable of storing instructions and data in memory. ▪ Used mercury delay lines for memory, vacuum tubes for logic.
UNIVAC **1951**	J. Presper Eckert and John Mauchly (America)	▪ First general-purpose electronic computer with large amount of input and output.	▪ Used magnetic tapes as input and output. ▪ Use for account work.
IBM-650 Computer **1953**	IBM Company	▪ Provided input/output units converting alphabetical and special characters to two-digit decimal code.	▪ Payroll processing ▪ Oil refinery design ▪ Market research analysis

Generations of Computer

A generation refers to the state of improvement in the development of system. Each generation of computer is characterised by a major technological development that fundamentally changed the way, computers operate.

Generations	Switching Devices	Storage Devices/Speed	Operating Systems/ Programming Languages	Characteristics	Applications
First (1940-56)	Vacuum tubes	Magnetic drums (milli seconds)	Batch operating system /Machine language (Binary numbers 0's and 1's)	▪ Fastest computing device. ▪ Generate large amount of heat. ▪ Non-portable.	▪ Used for scientific purpose. e.g. ENIAC, UNIVAC, MARK-1, etc.
Second (1956-63)	Transistors (Made up of semiconductors)	Magnetic core technology (micro seconds)	Time sharing OS, Multitasking OS/ Assembly language, high level language	▪ More reliable and less prone to hardware failure. ▪ Portable and generate less amount of heat.	▪ Used for commercial production. e.g. PDP-8, IBM-1401, etc.
Third (1964-71)	Integrated Circuits (ICs) (Made up of silicon)	Magnetic core as primary storage medium (nano seconds)	Real-time system/ High level language (FORTRAN, COBOL, ALGOL)	▪ Consumed less power. ▪ Highly sophisticated technology required.	▪ Database management system e.g. NCR-395, B6500, etc.
Fourth (1971-Present)	Large Scale Integrated (LSI) circuit, microprocessor	Semi conductor memory, Winchester disc (pico seconds)	Time sharing /PASCAL, ADA, COBOL-74, FORTRAN IV	▪ More reliable and portable. ▪ This generation leads to better communication and resource sharing.	▪ Electronic fund transfer, Distributed system, e.g. Intel 4004 chip, Macintosh.
Fifth (Present and Beyond)	Super Large Scale Integrated (SLSI) chips	Optical disc	Knowledge Information Processing System	▪ Parallel processing. ▪ Intel core microprocessor is implemented. ▪ Enables mega chips.	▪ Artificial intelligence e.g. Robotics.

Classification of Computer



Based on Size

Microcomputer

This type of computer is the least powerful than other computers, which are based on size, yet the most widely used and is also called **portable computer**.

Some types of microcomputer are as follows

(a) **Desktop Computer or Personal Computer** (PC) This is small and relatively economical computer. This is based on the microprocessor technology (Integrated Circuit-IC).

(b) **Laptop** This computer is also known as **ultra book** or **notebook**. This is portable and lightweighted. It includes rechargeable battery, so you can work with this anywhere.

(c) **Handheld or Palmtop Computer** This is the smallest and is designed to fit into the palm. So, this is also known as **palmtop**.
It is practical for certain functions such as phone books and calendars. It uses the pen for input instead of keyboard. *For example*, PDA (Personal Digital Assistant), tablets, etc.

(d) **Workstation Computer** This computer is dedicated to a user or group of users engaged in business or professional work. It includes one or more high resolution displays and a faster processor than a Personal Computer (PC).

Nano Computer

Nano computer is a general term used to describe a computer smaller than a microcomputer, usually about the size of a credit card.

For example, Raspberry Pi, which could be used in schools to teach science to children.

Embedded Computer

It is a small size, powerful and easy to operate electronic module, based on microcontroller/ microprocessor and acts as a bridge between electronics hardware and computer software. e.g. cellphone, camera, automotive system, digital watch, etc.

Quantum Computer

Quantum computer was first introduced by Richard Feynman. It uses quantum mechanical phenomena. It is the fastest computer imitating brain working.

Minicomputer

These are smaller in size, faster and cost lower than mainframe computers. Initially, the minicomputer was designed to carry out some specific tasks, like engineering and Computer Aided Design (CAD) calculations.

But now, they are being used as central computer which is known as **server**. The speed of minicomputer is between 10 to 30 MIPS (Million Instructions Per Second). First minicomputer was PDP-8. Some examples of minicomputer are IBM-17, DEC PDP-11, HP-9000, etc.

Mainframe Computer

These types of computer having large internal memory storage and comprehensive range of software. It is considered as the heart of a network of computers or terminals that allow a large number of people to work at the same time. Some examples of mainframe computer are IBM-370, IBM-S/390, UNIVAC-1110, etc.

Supercomputer

These are the fastest and most expensive computers. They have high processing speed compared to other computers. Supercomputers are most powerful, large in size and memory, compared to all other computers.

The speed of supercomputers are measured in FLOPS (Floating Point Operations Per Second). Supercomputers are used for highly calculation intensive tasks, such as weather forecasting, nuclear research, military agencies and scientific research laboratories.

Some examples of supercomputer are described below

(i) **CRAY-1** was the world's first supercomputer introduced by Seymour R CRAY (Father of Supercomputing) in 1976.

(ii) **PARAM** was the first supercomputer developed by Vijay Bhatkar in India in 1991.

(iii) **PARAM Siddhi** is the latest machine in the series of PARAM made by C-DAC and released on 16 November, 2020.

(iv) **Pratyush**, the first multi-petaflops supercomputer was unveiled at Pune based Indian Institute of Tropical Meteorology (IITM) in India.

(v) **Fugaku** is a claimed exascale supercomputer at the RIKEN Center for Computational Science in Kobe, Japan. It is scheduled to start operating in 2021. It has defended its title as the world's fastest supercomputer.

Based on Work

On the basis of work, computer is categorised as follows

Analog Computer

These computers carry out arithmetic and logical operations by manipulating and processing of data. *For example,* Speedometers, seismograph, etc.

Analog computer can perform several mathematical operations simultaneously. It uses continuous variables for mathematical operations and utilises mechanical or electrical energy.

Digital Computer

These computers work on binary digits. A digital computer, not only performs mathematical calculations, but also combines the bytes to produce desired graphics, sounds.
For example, Desktop (PC).

Hybrid Computer

These computers are the combination of analog and digital computers. Machines used in hospitals like ECG and DIALYSIS are the commonly used hybrid computers.

Based on Purpose

On the basis of purpose, computer is categorised as follows

General Purpose Computer

General purpose computers are those computers, which are used to solve variety of problems by changing the program or instructions.

For example, To make small database, calculations, accounting, etc.

Special Purpose Computer

Special purpose computers are those computers' which are used to solve a single and dedicated type of problem.

For example, Automatic aircraft landing, multimedia computer, etc.

Tit-Bits

- **Charles Babbage** is known as the father of computer. **Alan Turing** is known as the father of the modern computer.
- **Siddhartha** was the first computer developed in India. First computer in India was installed in Indian Statistical Institute (ISI), Kolkata.
- Transistors were invented by Bell Laboratory.
- In 1958, Jack St. Clair Kilby and Robert Noyce invented the first IC (Integrated Circuit).
- ENIAC (Electronic Numerical Integrator and Computer) was the first electronic computer developed in Moore School of Engineering, USA.

QUESTION BANK

1. The word 'computer' has been derived from which of the following language?
(1) Greek (2) English
(3) Hindi (4) Latin

2. Input, output and processing devices grouped together represent a(n)
(1) mobile device
(2) information processing cycle
(3) circuit board
(4) computer system

3. Which of the following is the correct order of the four major functions of a computer?
(1) Process, Output, Input, Storage
(2) Input, Output, Process, Storage
(3) Process, Storage, Input, Output
(4) Input, Process, Output, Storage

4. Collecting the data and converting it into information is called
(1) processing (2) compiling
(3) importing (4) exporting

5. Computer cannot perform
(1) input (2) output
(3) thinking (4) processing

6. A computer cannot perform which of the following functions?
(1) Addition (2) Subtraction
(3) Bake a cake (4) Division

7. Part number, description and number of parts ordered are examples of
(1) control (2) output
(3) processing (4) feedback

8. Benefit(s) of computer is/are
(1) very fast and can store huge amount of data
(2) provide accurate output either input is correct or not
(3) think about the processing
(4) All of the above

9. A collection of unprocessed items is
(1) information (2) data **[SBI PO 2015]**
(3) memory (4) reports
(5) None of these

10. Which among the following cycle consists of input, processing, output and storage as its constituents? **[IBPS Clerk Mains 2017]**
(1) Processing (2) Output
(3) Input (4) Storage
(5) Data

11. ..... is data that has been organised and presented in a meaningful fashion. **[IBPS Clerk Mains 2017]**
(1) A process (2) Software
(3) Storage (4) Information
(5) Data

12. Data or information used to run the computer is called
(1) hardware (2) CPU
(3) peripheral (4) None of these

13. The steps and tasks needed to process data, such as responses to questions or clicking an icon, are called **[IBPS Clerk Mains 2017]**
(1) instructions
(2) the operating system
(3) application software
(4) the system unit
(5) the hardware unit

14. The earliest calculating device is
(1) calculator (2) abacus
(3) difference engine (4) analytical engine

15. Abacus can perform
(1) addition (2) subtraction
(3) multiplication (4) Both (1) and (2)

16. The Napier's technology used for calculation is called
(1) Naptologia (2) Vibologia
(3) Semiconductor (4) Rabdologia

17. Pascaline is also known as
(1) abacus (2) adding machine
(3) division machine (4) difference machine

18. Punched cards were first introduced by
(1) Powers (2) Pascal
(3) Jacquard (4) Herman Hollerith

19. Punched card is also called **[RRB NTPC 2016]**

A. Hollerith card B. Video Card
C. Sound Card D. Accelerator Card

Codes

(1) B (2) C
(3) A (4) D

20. Which of the following is known as father of computer? **[SSC CGL 2015, UPSSSC 2016]**

(1) Dennis Ritchie (2) Napier
(3) Charles Babbage (4) Alan Turing

21. Who is known as the father of the modern computer?

(1) Charles Babbage (2) Alan Turing
(3) Blaise Pascal (4) Jordan Murn

22. Analytical engine developed by

(1) Blaise Pascal (2) Charles Babbage
(3) Dennis Ritchie (4) Alan Turing

23. The analytical engine developed during first generation of computers used ..... as a memory unit.

(1) RAM (2) floppies
(3) cards (4) counter wheels

24. Tabulating machine was the first electromechanical machine developed by

(1) Herman Hollerith (2) Howard Aiken
(3) Blaise Pascal (4) John Napier

25. Who among the following created the Electronic Discrete Variable Automatic Computer (EDVAC) with a memory to hold both, a stored program as well as data? **[SSC CGL 2018]**

(1) Thomas H Flowers (2) Arthur Samuel
(3) Bletchley Park (4) John Von Neumann

26. The first computer which provides storage is

(1) EDSAC (2) EDVAC
(3) MARK-I (4) ACE

27. Name the first general purpose electronic computer.

(1) ADVAC (2) ADSAC
(3) UNIVAC (4) EDVAC

28. Computer size was very large in

(1) first generation
(2) second generation
(3) third generation
(4) fourth generation

29. First generation computers were based on

(1) transistors (2) conductors
(3) ICs (4) vacuum tubes

30. Computer built before the first generation computer was

(1) mechanical
(2) electromechanical
(3) electrical
(4) electronics

31. First generation computers used ..... language(s).

(1) machine (2) assembly
(3) Both (1) and (2) (4) high level

32. The second generation of computers was witnessed in the years from **[UPSSSC 2018]**

(1) 1940-1956 (2) 1963-1972
(3) 1957-1962 (4) 1973-Present

33. Second generation computers can be characterised largely by their use of **[SSC CGL 2018]**

(1) integrated circuits (2) vaccum tubes
(3) microprocessors (4) transistors

34. Speed of first generation computer was in

(1) nano seconds
(2) milli seconds
(3) nano-milli seconds
(4) micro seconds

35. Time sharing became possible in ..... generation of computers.

(1) first (2) second
(3) third (4) fourth

36. Third generation of computers was witnessed in the years from.....

[UPSSSC 2018]

(1) 1940-1956 (2) 1963-1972
(3) 1957-1962 (4) 1973-Present

37. Integrated Circuits or ICs were started to be used from which generation of computers? **[IBPS PO 2016]**

(1) First generation (2) Second generation
(3) Third generation (4) Fourth generation
(5) Fifth generation

38. Chip is a common nickname for a(n) **[IBPS Clerk 2014, 15]**

(1) transistor (2) resistor
(3) integrated circuit (4) semiconductor
(5) None of these

39. Integrated Circuit (IC) or chips used in computers are made with **[IBPS Clerk 2014]**

(1) copper (2) aluminium
(3) gold (4) silicon
(5) silver

40. Who developed integrated chip?

(1) Robert Nayak (2) C Babbage
(3) JS Kilby (4) CV Raman

41. A complete electronic circuit with transistors and other electronic components on a small silicon chip is called a(n)

(1) workstation (2) CPU
(3) magnetic disc (4) integrated circuit

42. PCs are considered fourth generation and contain **[SBI PO 2014]**

(1) information (2) data
(3) vacuum tubes (4) microprocessors
(5) transistors

43. Fifth generation computers do not have **[SSC MTS 2012]**

(1) speech recognition
(2) artificial intelligence
(3) very large scale integration
(4) vacuum tubes

44. Match the following.

	List I		List II
A	First generation	1.	Transistor
B	Second generation	2.	VLSI microprocessor
C	Third generation	3.	Vacuum tube
D	Fourth generation	4.	Integrated circuit

[UGC NET June 2019]

Codes

	A	B	C	D
(1)	3	4	1	2
(3)	3	1	2	4

	A	B	C	D
(2)	3	1	4	2
(4)	1	3	4	2

45. Small and cheap computers built into several home appliances are of which type? **[SSC (10+2) 2011]**

(1) Mainframes (2) Mini computers
(3) Micro computers (4) None of these

46. Desktop and personal computers are also known as

(1) supercomputers (2) servers
(3) mainframes (4) microcomputers

47. Computers that are portable and convenient to use for users who travel, are known as

(1) supercomputers
(2) minicomputers
(3) mainframe computers
(4) laptops

48. Which of the following uses a handheld operating system?

(1) A supercomputer
(2) A personal computer
(3) A laptop
(4) A PDA

49. Palmtop computer is also known as

(1) personal computer
(2) notebook computer
(3) tablet PC
(4) handheld computer

50. Which of the following is a small microprocessor based computer designed to be used by one person at a time? **[SBI Clerk 2014]**

(1) Netbook (2) Supercomputer
(3) All-in-one (4) Notebook
(5) Personal computer

51. Which of the following options correctly expresses the meaning of the term 'PCs'? **[IBPS PO 2012]**

(1) Independent computers for all working staff.
(2) Personal computers widely available to individual workers with which they can access information from layer systems and increase their personal productivity.
(3) Packed computers system formed by joining together of various computer terminals.
(4) Computer manufactured by the Pentium Company.
(5) None of the above

52. Desktop computers, laptop computers, tablets and smartphones are different types of **[SSC CGL 2018]**
(1) supercomputers
(2) mainframe computers
(3) microcomputers
(4) minicomputers

53. In the context of digital computer, which of the following pairs of digits is referred to as binary code? **[SSC CGL 2018]**
(1) 3 and 4 (2) 0 and 1
(3) 2 and 3 (4) 1 and 2

54. A central computer that holds collection of data and programs for many PCs, workstations and other computers is a
(1) supercomputer
(2) minicomputer
(3) laptop
(4) server

55. First mini computer was **[UPSSSC 2016]**
(1) PDP-8 (2) ENIAC
(3) UNISAC (4) EDVAC

56. Which of the following is generally costlier? **[IBPS Clerk 2015]**
(1) Server (2) Notebook computer
(3) Personal computer (4) Laptop computer
(5) Mainframe

57. The user generally applies ..... to access mainframe or supercomputer.
(1) terminal (2) node
(3) desktop (4) handheld

58. First computer of India is
(1) PARAM (2) Siddhartha
(3) IBM-370 (4) CRAY-1

59. Where was the first computer in India installed? **[UPSSSC 2016]**
(1) Tata Institute of Fundamental Research (TIFR), Mumbai
(2) Indian Statistical Institute (ISI), Kolkata
(3) Compunational Research Laboratory (CRL), Pune
(4) Indian Railway, New Delhi

60. First supercomputer developed in India is
(1) PARAM (2) CRAY-1
(3) PARAM ISHAN (4) EPRAM

61. Pratyush is ..... fastest supercomputer in the world.
(1) first (2) second
(3) third (4) fourth

62. Example of super computer is **[UPSSSC 2016]**
(1) CRAY-2 (2) CRAY XMP-24
(3) Tianhe-2 (4) All of these

63. Which of the following is a supercomputer developed by India? **[SSC CGL 2018]**
(1) Param Yuva 2 (2) Onshape
(3) Venngage (4) Pixir

64. In 1991, India's first indigenous supercomputer named ..... was developed by Vijay Bhatkar. **[SSC CGL 2018]**
(1) Prayas 3000 (2) Prayog 2000
(3) Param 8000 (4) Pragati 5000

65. Who among the following is called the father of supercomputing? **[SSC CGL 2018]**
(1) Ken Thompson (2) Alan Perlis
(3) Seymour Cray (4) Vint Gerf

66. India's fastest and first multi-petaflops supercomputer named Pratyush was unveiled at **[SSC CGL 2017]**
(1) Indian Space Research Organisation
(2) Indian Institute of Science, Bangalore
(3) Indian Institute of Tropical Meteorology, Pune
(4) Indian Institute of Technology, New Delhi

67. Choose the odd one out.
(1) Microcomputer (2) Minicomputer
(3) Supercomputer (4) Digital computer

68. A hybrid computer is the one having the combined properties of
(1) super and microcomputers
(2) mini and microcomputers
(3) analog and digital computers
(4) super and mini computers

69. Computer system which do not require any storage device? **[RRB NTPC 2016]**
A. Analog
B. Digital
C. Hybrid
D. Third generation computer
Codes
(1) B (2) A (3) D (4) C

70. The ..... computer is the most common type of computer. It is used to process information with quantities usually using the binary number system. **[UPSSSC 2018]**
(1) Hybrid (2) Digital
(3) Analog (4) Complex

71. Calculator works on which type of computer's work method? **[UPSSSC 2015]**
(1) Hybrid computer
(2) Analog computer
(3) Digital computer
(4) None of the above

72. Which of the following computer is mainly related to convert analog output into digital form? **[UPSSSC 2016]**
(1) Digital computer
(2) Analog computer
(3) Hybrid computer
(4) Mainframe computer

73. Which of the following is not the example of special purpose computer?
(1) Automatic aircraft landing
(2) Word processor
(3) Multimedia computer
(4) All of the above

74. Which type of computer is used in automatic aircraft landing?
(1) General purpose computer
(2) Supercomputer
(3) Special purpose computer
(4) Microcomputer

75. Which of the following is the smallest and fastest computer imitating brain working?
(1) Supercomputer **[IBPS PO 2016]**
(2) Quantum computer
(3) Param-10000
(4) IBM chips
(5) None of the above

ANSWERS

1. *(4)*	2. *(4)*	3. *(4)*	4. *(1)*	5. *(3)*	6. *(3)*	7. *(3)*	8. *(1)*	9. *(2)*	10. *(5)*
11. *(4)*	12. *(4)*	13. *(1)*	14. *(2)*	15. *(4)*	16. *(4)*	17. *(2)*	18. *(3)*	19. *(3)*	20. *(3)*
21. *(2)*	22. *(2)*	23. *(4)*	24. *(1)*	25. *(4)*	26. *(1)*	27. *(3)*	28. *(1)*	29. *(4)*	30. *(2)*
31. *(1)*	32. *(3)*	33. *(4)*	34. *(2)*	35. *(2)*	36. *(2)*	37. *(3)*	38. *(3)*	39. *(4)*	40. *(3)*
41. *(4)*	42. *(4)*	43. *(4)*	44. *(2)*	45. *(3)*	46. *(4)*	47. *(4)*	48. *(4)*	49. *(4)*	50. *(5)*
51. *(2)*	52. *(3)*	53. *(2)*	54. *(4)*	55. *(1)*	56. *(5)*	57. *(2)*	58. *(2)*	59. *(2)*	60. *(1)*
61. *(4)*	62. *(4)*	63. *(1)*	64. *(3)*	65. *(3)*	66. *(3)*	67. *(4)*	68. *(3)*	69. *(2)*	70. *(2)*
71. *(3)*	72. *(3)*	73. *(2)*	74. *(3)*	75. *(2)*					