HISTORICAL DEVELOPMENTS OF COMPUTERS

1. Early counting devices (Definition and Examples)

The history and development of computer can be traced back to the studies of Mathematics which started with counting. The major problem with these devices was that they could not be used for counting large numbers efficiently. These has led to various computing inventions in search for a tool that could enable man meet his computational and data processing needs until we have the computer today.
It was in the process of finding solutions to the problem of counting that early counting devices emerged. These devices includes fingers, toes, stones, sticks, pebbles, cowries etc.
As time went on, fingers and toes method became ineffective, especially for large numbers, hence, the emergence of counting and solving basic arithmetic problems with the use of stones and sticks.

2. Mechanical counting and calculating devices

As a result of the disadvantages of the early counting devices, a more advanced mechanical counting and calculating devices were invented. Some of these are;
• Abacus
• Slide
• Speeding Clock or Calculating Clock

THE ABACUS
The Abacus was developed in China and is made up of beads threaded on iron rods. The iron rods were fixed on a rectangular wooden frame. The Abacus was used for addition and subtraction. It could not carry out complex mathematics. The Abacus was earlier used for arithmetic tasks.

SLIDE RULE
The slide rule also known as a slipstick is a mechanical analogue computer. The slide rule is used primarily for multiplication, division, and also functions such as roots, algorithms and trigonometry, but is not normally used for addition or subtraction. William Oughtred and others developed the slide rule in the 1600's based on the emerging work on logarithms by John Napier.

SPEEDING CLOCK OR CALCULATING CLOCK
Schickard invented a calculating machine in 1623. His colleagues called his machine the Speeding Clock or Calculating Clock. The machine could add and subtract six-digit numbers, and indicate an overflow of this capacity by ringing a bell; to add more complex calculations, a set of Napier's bones were mounted on it. Schickard's machine was not programmable.

3. ELECTRO-MECHANICAL COUNTING DEVICES

These are counting devices that could be operated both electrically and mechanically. Electro-mechanical devices include the following:
(i) John Napier Bone
(ii) Blaise Pascal machine
(iii) Gottfried Leibniz Machine
(iv) Joseph Jacquard Loom
(v) Charles Babbage Analytical Machine

JOHN NAPIER BONE
While producing the first logarithmic tables, Napier needed to perform many multiplications, and it was at this point that he designed Napier's bones in 1614, an abacus-like device used for multiplication and division.

BLAISE PASCAL'S CALCULATING MACHINE

Blaise Pascal was a French man who developed the first true adding machine in 1642. He was a mathematical as well as a philosopher. In 1642, he began working on calculating machines and after 3 years, he invented the mechanical calculator. He built 20 of these machines (called the Pascaline) in the following 10 years.
Blaise Pascal was born in France in 1623 and died in Paris in 1662. His machine was based on Abacus principle.

GOTTFRIED W. VON LEIBNITZ

He carried out further development on the work of Blaise Pascal so that multiplication and division could be carried out directly. He invented a machine called "THE STEPPED RECKONER" in 1694. The machine is a mechanical calculator which can do multiplication, division and calculate square roots.

JOSEPH JACQUARD LOOM

Jacquard Loom is a mechanical loom invented by Joseph Marie Jacquard in 1801. The loom simplifies the process of manufacturing textiles with complex patterns such as brocade and damask. The loom is controlled by paste board cards with punched holes, each row of which corresponds to one row of the design. Multiple rows of holes are punched on each card and the many cards that compose the design of the textile are strung together in order.
The Jacquard loom was the first machine to use punch cards to control a sequence of operations.

ANALYTICAL MACHINE

Charles Babbage was the first person to design a computer that is different from a calculator. In 1822, he developed 'difference engine' that could perform intricate calculations correctly and rapidly on the principle that anticipated the modern electronic computer. In 1837, the 'analytical engine' was developed and it could be programmed. That means it can receive instructions and solve problems given to it. Charles Babbage is referred to as the father of modern day computers because all his ideas are contained in modern computers.

The Analytical Engine had the following parts:
- A mill for calculation
- A store for holding instructions, intermediate and final results
- An operator (or system) for carrying out instruction
- A device for 'reading' and 'writing' data on punched card

PHILIP EMEAGWALI

Dr. Philip Emeagwali, who had been called the Bill Gates of Africa, was born in Akure, Nigeria on the 23rd of August 1954. He invented one of the world's fastest computers. He dropped out of school in 1967 because of the Nigerian-Biafran war.
Dr. Philip Emeagwali first entered the limelight in 1989 when he won the prestigious Gordon Bell Prize for his work with massively parallel computers.

4. ELECTRONIC COUNTING DEVICES

HERMAN HOLLERITH PUNCH CARDS

HOLLERITH CENSUS MACHINE: Herman Hollerith (February 29, 1860 – November 17, 1929) was an American statistician and inventor who developed a mechanical tabulator based on punched cards to rapidly tabulate statistics from millions of pieces of data. He was the founder of the Tabulating Machine Company that later merged to become IBM. Hollerith is widely regarded as the father of modern automatic computation.

JOHN VON NEUMANN MACHINE

It was developed in the 1940s. Von Neumann developed the stored program concept in which programs could be read into computer's memory for processing. His area of interest included:
Use of binary codes for representing data and instructions.
Use of codes to store both data and instruction together and share the same storage location (space) within the computer
Use of computer to process both data and instructions
Modification of programs by programs.