Avinash Kumar
BCA 1st Sem
16113

60/70

(1)

Intro to CS

26/11/16

6

ANSWERS

Ans 1) As early as the 17th century, mathematicians tried to create a machine that could perform basic mathematical functions like addition, subtraction, multiplication & division.

In 1804, a british scientist, Charles Babbage invented an all-purpose machine, called the difference engine which had a mechanical memory to store the result.

There are total 5 generations of computer —

(a) First Generation :-

* The period of 1st Generation computer was from 1946 to 1959.

* The 1st Generation computer started with the use of vacuum tube which ~~produced~~ as the basic memory and circuitry element. The vacuum tube ~~first~~ like an electric bulb produced a great amount of heat which subjected the computer to ~~damage~~ frequent fusing and it was made it expensive which could be affordable by only large organization.

* Punched cards, magnetic tape & paper tape were used.

* Batch time operating system was used in the 1st Gen. of Computer.

* Main feature of 1st Generation Computer are :-

(i) Use of vacuum tube technology.
(ii) Provided only machine language.
(iii) Non-portable.
(iv) Very Costly
(v) Non-Reliable.
(vi) Large size.
(vii) Slow input & output devices.
(viii) Generate a lot of heat.

(b) 2nd Generation Computer :—

* The period of 2nd Generation computers was from 1959-1965.

* Transistors were used instead of vacuum tubes.

* Transistor was invented in 1947 by Jack Kilby. The invention of transistors made the computer more reliable, cheaper and smaller in size. The transistor didn't see widespread use till late 1950's.

* Transistors were far better than vacuum

tube though it produce heat, but in a lesser amount as compared to vacuum tube.

* Time sharing O.S, real-time O.S were used.

~~Main features are~~

* Punched cards were used as basic input devices & printouts were used as output devices.
* Languages like DBASE, etc were used.

Main features are :-

(i) Use of Transistors
(ii) Still very costly
(iii) Generate less amount of heat
(iv) More reliable than 1st generation computer
(v) Small size than 1st generation computer
(vi) Used machine language and assembly language.

(c) 3rd Generation Computer

* The period of 3rd generation was 1965-1971
* In this generation, Integrated circuit (IC's) was used.
* IC's contains a lot of transistors, resistors and capacitors and associated circuitry elements.

* It allow the computer to become more cheaper, energy efficient, more-reliable, small in size and cheaper.

* Distributed OS, Real time OS, and Time Sharing OS were used.

* High level languages like Algol-68, Pascal PL/1, BASIC, C & C++ FORTRAN-II -IV) were used.

Main features are:

(i) Use of ic's
(ii) Less costly
(iii) More Reliable
(iv) Faster than previous generation.
(v) More energy efficient.
(vi) Smaller in size.
(vii) High level languages were used.
(viii) Produced a lesser amount of heat.

Avinash Kumar
BCA 1st Sem
1648

Intro to Comp. Sc.

26/11/16

(d) 4th Generation :-

* The period of this generation was from 1971 - 1980.

* This generation was marked by the use of VLSI (Very large Scale Integral) circuits in place of IC which contained over 5000 elements of associated circuitry (Resistors, capacitors, transistors) in a single chip.

* The VLSI helped in making micro-processing computers which helped in making personal computers (PC's).

* The use of VLSI decreased the cost, its size, and made the system more reliable and portable.

Main features

(i) The use of VLSI
(ii) Portable.
(iii) Introduced the concept of Internet.
(iv) Cheap, affordable pc's.
(v) More reliable systems.
(vi) Languages like c&c++, .Net, JAVA etc were used.

(e) 5th Generation

* The VLSI became ULSI (Ultra large scale Integral circuits).

* The period of this generation is 1980— till date.

* In this generation parallel processing hardware & AI (artificial Intelligence) is used.

* Artificial Intelligence is a new growing branch of computer science which means and methods to make the computer think like human being.

* AI includes —
  - Game Playing
  - Robotics
  - Neural Network,
  - and many more

* Common language is made to understand by the computer

Main features

*(i) Introduction of true Artificial Intelligence.
(ii) Better user interface with multimedia support.

(iii) The VLSI contains more than 10 million circuitry elements, which helps to create microprocessing devices.

(iv) Parallel processing hardware is used.

Ans 2) Networking is the connectivity between two or more devices to share resources between them.
Types of networking are :—

(i) ~~Local Area Network (LAN)~~

(i) Based on size —

* Local Area Network (LAN)
* Metropolitan Area Network (MAN)
* Personal Area Network (PAN)
* Wide Area Network (WAN)

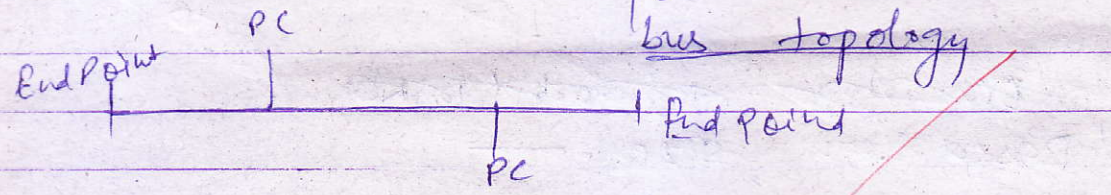
(ii) Based on main purpose —

* Storage Area Network (SAN)
* Enterprise Private Network (EPN)
* Virtual Private Network (VPN)
* Campus Area Network (CAN)

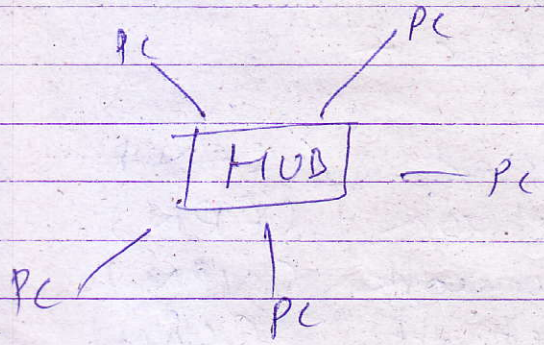
Ans 3) Topology is the arrangement of various elements (like nodes, links etc) of a computer network. ~~It can be depicted using by physical topology.~~

Types of topology are :—

(i) Bus Topology :- In this, the computer & network are connected to a single cable. When it has exactly two end points, it's called Linear bus topology



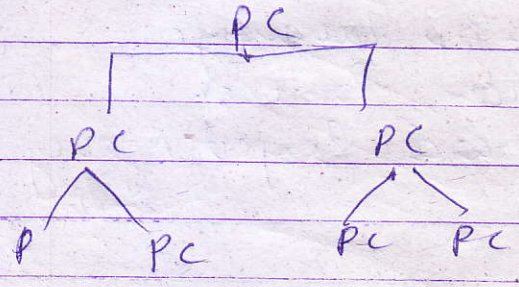
(ii) STAR Topology :- In this, the devices are connected to a centre hub. The hub is called the central node and all other nodes are connected to it by the cables.



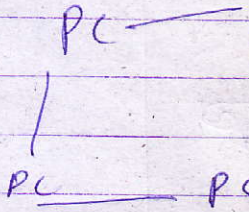
Avinash Kumar
BCA 1st Sem
16118
Intro to Comp Sc

26/11/16

(iii) TREE topology :- In this, every other node is connected to the central node by the means of cable forming a hierarchy. It should have atleast 3 level to the hierarchy.



(iv) RING topology :- In this, devices are connected either clockwise or anticlockwise. In this each system is connected to each other, that with the last connected to the first forming a ring.



Ans 4) UDP – User datagram Protocol
HTTP – Hyper Text Transfer Protocol
HTML – Hyper Text Mark-up Language
RIP – Routing Information Protocol.
ARPANET – Advanced Research Project Agency Network

Ans 5) a) $(10101010)_2 \rightarrow (\quad)_{10}$

$= 1\times2^7 + 1\times2^5 + 1\times2^3 + 1\times2^1 + 0$
$= 128 + 32 + 8 + 2$
$= 128 + 42$
$= (170)_{10}$ Ans

Rough
16
16
256
9
2304

b) $(AB2)_{16} \rightarrow$ ~~(2500)8~~ (Ans)

8	1024 | 512	0
8	128 | 64	0
8	16 | 8	6
8	1 | 9	3
	2	

$= (10101011\,0010)_2$
$= (5262)_8$ Ans

(c) $(995)_{10} \rightarrow (\quad)_{16}$

$= 9 \times 16^2 + 9 \times 16^1 + 5 \times 16^0$

$= 2304 + 144 + 5$

$= 2453$ Ans

(c) $(995)_{10} \Rightarrow (\quad)_{16}$

16	995	3
16	62	14
	3	

$= 3143$

$= (3E3)_{16}$ Ans

(d) $(477)_8 \rightarrow (\quad)_2$

$= (100\ 111\ 111)_2$ Ans

(e) $(255)_8 \rightarrow (\quad)_{16}$

$(0000\ 1010\ 1011)_2$

A D

$= (AD)_{16}$ Ans

(f) $(111010111)_2 \rightarrow (\quad 1B7 \quad)_{16}$ (dy)

$\underline{0}\,\underline{0}\,\underline{0}\,\underline{1}\,\underline{1}\,\underline{1}\,\underline{0}\,\underline{1}\,\underline{0}\,\underline{1}\,\underline{1}\,\underline{1}$

1 B 7

(g) $(11111101)_2 \rightarrow (\quad 775 \quad)_8$

0	0 0 0 0	
1	0 0 0 1	
2	0 0 1 0	
3	0 0 1 1	
4	0 1 0 0	
5	0 1 0 1	
6	0 1 1 0	
7	0 1 1 1	
8	1 0 0 0	
9	1 0 0 1	
10 A	1 0 1 0	
11 B	1 0 1 1	
12 C	1 0 1 1	
13 D		

1 1 1 1

A - 1010

B - 1011

0010

$(1\,0\,1\,0\,1\,0\,1\,1\,0\,0\,1\,0)$

5 2