

<b>Course Code</b>	<b>:</b>	<b>BCS-011</b>
<b>Course Title</b>	<b>:</b>	<b>Computer Basics and PC Software</b>
<b>Assignment Number</b>	<b>:</b>	<b>BCA (1)/011/Assignment/2022-23</b>
<b>Maximum Marks</b>	<b>:</b>	<b>100</b>
<b>Last Date of Submission</b>	<b>:</b>	<b>31<sup>st</sup> October, 2022 (For July Session)</b> <b>15<sup>th</sup> April, 2023 (For January Session)</b>

**This assignment has three questions of 80 marks. Answer all the questions. Rest 20 marks are for viva voce. You may use illustrations and diagrams to enhance explanations. Please go through the guidelines regarding assignments given in the Programme Guide for the format of presentation. Please give precise answers. The word limit for each part is 200 words.**

**Q1. (Covers Block 1) (7×4=28)**

- a)** What is VLSI? How did it change the design of a computer system? Explain the working of von Neumann Architecture with the help a diagram. Also explain the process of execution of an instruction for a von Neumann machine.
- b)** What are the different standards of representing character in a computer? Name and explain any two such standards with the help of examples. List the ASCII codes of all the decimal digits.
- c)** Convert the following numbers as directed
  - (i) Decimal 197.0625 into equivalent binary and hexadecimal.
  - (ii) Decimal 4567654 into binary and hexadecimal
  - (iii) String “Character Codes of alphabets and special character \$ #” to ASCII and UNICODE strings.
  - (iv) Hexadecimal ABCDFFED to decimal and binary
- d)** What is the need of ROM in a computer? How is it different to RAM? Why is cache memory needed even if a computer has RAM and ROM? Why secondary memory is needed?
- e)** Explain the disk layout of Hard disk and CD-ROM? Also, explain the access time of magnetic disk and CD-ROM. Which of these has smaller access time?
- f)** Compare and contrast the following technologies:
  - (i) Parallel port and Serial port
  - (ii) Mouse and Light pen
  - (iii) Voice based input and Keyboard input
  - (iv) Inkjet printers and Laser printers

**g)** Explain the characteristics/functions of the following in the context of a computer system:

- (i) Proxy Server
- (ii) Motherboard
- (iii) Scandisk utility
- (iv) My Documents

**Q2. (Covers Block 2)**

**(7x4=28)**

- a)** What are the key features of client/server architecture? What are the benefits of using client/server architecture? How is file sharing architecture different from client/server architecture?
- b)** Explain the characteristics of object-oriented programming? What are the advantages of using object-oriented programming?
- c)** List and explain the functions of the following in the context of software:
- (i) Types of Software Licensing
  - (ii) Software as a service
  - (iii) Diagnostic programs
  - (iv) Perverse Software
- d)** Explain the following in the context of an Operating System:
- (i) Graphical User Interface and Command line interface
  - (ii) Directory structure and its use in File Management
  - (iii) Input/Output Services
  - (iv) Process management in multitasking operating system
  - (v) Time Sharing system
  - (vi) Memory management in multi-programming operating system
- e)** Draw a flow chart and write an algorithm to find the sum of the digits of any two digit number given as input. (Hint: For the input number 68, the sum of digits would be  $6+8=14$ . The key is to extract each digit.).
- f)** Explain the meaning and output of each line of the following program segment. How many times the loop at (ii) and (iii) will be executed?
- (i) `int n = 10;`
  - `int i, x=1;`
  - (ii) `for (i=1; i<=n; i=i+2)`
    - {
    - (iii) `x = x * i;`
    - }
  - (iv) `printf ("The final value is %d ", x);`

- g)** Identify the software or type of software that will be required for the following situations. Also, explain the steps that would be performed to solve the situation in question, if applicable.
- (i) A software development company maintains the list of tasks, expected time of completion of the tasks on which staff, people are working. Which software would help the company in planning and scheduling the projects.
  - (ii) You are planning to apply for a job in at least 10 companies. You are required to create a letter for the human resource management of each company. Identify which software and what features of that software would be used by you. Explain these features.
  - (iii) You want to judge the performance of each employee by finding the number of hours he/she has worked in last month. The employee attendance data (with in and out time) is available to you. This data is to be analyzed and suitable graphs are to be created to highlight individual work hours. Identify the suitable software and the features of the software that would be needed to create graphs.
  - (iv) You are required to create a meeting information system for an organization. This system should setup meetings for different groups of employees informing them about meeting date, meeting agenda, notes etc. What kind of software will you use for such work?

**Q3. (Covers Block 3)**

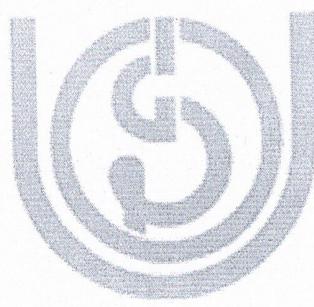
**(6×4=24)**

- (a)** What are the advantages of Computer Networks? Explain the following terms in the context of computer networks:
- (i) Mode of transmission
  - (ii) Packet and Circuit Switching
  - (iii) Optical Fiber
  - (iv) Radio Wave transmission
- (b)** Explain the characteristics of Bus topology and Ring topology. Also explain the characteristics of LAN and WAN. List one application each of LAN and WAN.
- (c)** Explain the functions of the following in the context of networking:
- (i) Modem
  - (ii) Network Interface cards
  - (iii) Repeaters
  - (iv) OSI model
- (d)** What is a URL and IP address? How are they related? How URL can be converted to an IP address? Explain with the help of an example. Explain how a subnet mask 255.255.255.0 will be able to help in identifying various components of an IP address.
- (e)** What is a search engine? What are the basic actions performed by a search engine? Explain. What would be search terms if you are looking forward to the following:
- (i) List of Universities offering PhD Programme in Computer Science

(ii) List of Browsing software.

**(f)** Explain the following in the context of Internet and its applications:

- (i) E-mail
- (ii) Collaborations



Enrolment No: .....

Name: ISHOWOR SAPKOTA .....

Address: Gokarneshwor-7, Kathmandu  
Nepal .....

Course Title: Computer Basics and PC Software

Course Code: BCS - 031

Assignment No: BCA (1)/011/Assignment | 2022-23

Study Centre: 9602 .....

Phone No.: 9851220845 .....

Email ID: sapkota.ishowor@gmail.com .....

Date: 30/10/2022 .....

Signature: Ishwar .....

Q1.

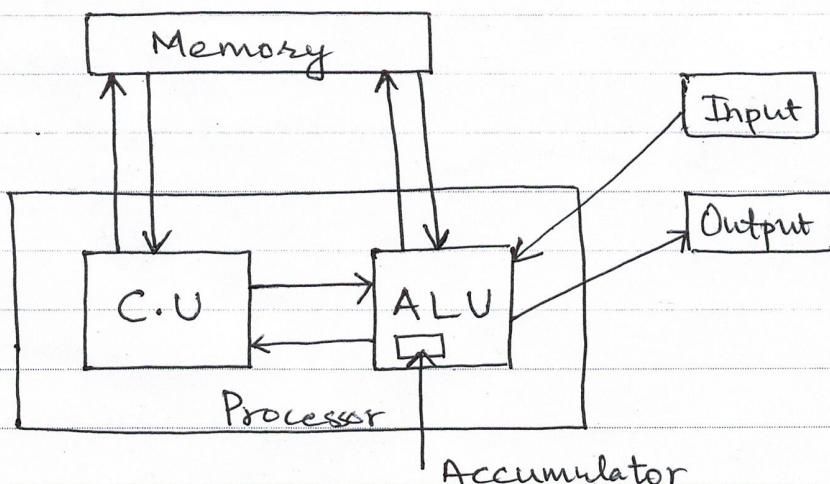
a) What is VLSI? How did it change the design of a computer system? Explain the working of von Neumann Architecture with the help of a diagram. Also explain the process of execution of an instruction for a von Neumann machine.

Very large scale Integration (VLSI) means LSI circuits build in a single silicon chips, reducing the size of computer. It was the revolutionary step in making recent 4<sup>th</sup> generation computers. VLSI is a concept of further reducing the single silicon chip joined to other different capacitors keeping all CPU units, memory units to input and output controls in a single board.

It reduced the size of a computer which filled a room to hold on a palm. It started the age of computer making it available to everyone.

~~von Neumann~~

von Neumann Architecture



In the diagram above, there is two units processor and memory. Two parts of processor C.U and ALU shares memory. All the instructions are stored in memory which is shared among

ALU and CU unit of processor. It implements the stored program concept in which the data and instructions both are stored in the memory. The memory is shared between different other units of processor.

### Process of Execution

ALU takes the input through the input devices accumulates the instructions and save it in the memory. All the instructions are processed one by one by the CPU and again output instructions is saved in the memory. After the completion of the whole process, all accumulated output by the ALU is displayed as output.

Q1. b) What are the different standards of representing characters in computer? Name and explain any two such standards with the help of examples. List the ASCII codes of all decimal digits.

Computer only understands the standard binary codes in the sets of 0 and 1. All the representing characters are standardized in different coding system. Some of them can be listed as;

- BCD code (decimal numbers)
- ASCII Code (information interchange between computer & keyboard)
- Reflected (Gray Code)
- Unicode (use over internet)

ASCII code :

It is alphanumeric code used for representing numbers, alphabets, punctuation symbols and other control characters. Its 8 bit code.

D H B

A - 65 0x41 01000001

Space - 32 0x20 00100000

a - 97 0x61 00111101

L - 10 0x0A 00001010

Unicode :

It is computing industry standard for the consistent encoding, representation and handling of text expressed in most of the world's writing system. More than 107,000 characters covering 96 scripts are encoded and given a special unicode.

ASCII codes for all decimal digits.

0 - 48	6 - 54
1 - 49	7 - 55
2 - 50	8 - 56
3 - 51	9 - 57
4 - 52	· - 46.
5 - 53	

- Q1. c) Convert the following numbers as directed.  
 i) Decimal 197.0625 into equivalent binary and hexadecimal.

Binary Conversion

$$(197.0625)_{10} = (11000101.101)_2$$

$$\begin{array}{r}
 2 \times 0.625 \rightarrow 1 \quad 2 \mid 197 \quad 1 \\
 2 \times 0.250 \rightarrow 0 \quad 2 \mid 98 \quad 0 \\
 2 \times 0.500 \rightarrow 1 \quad 2 \mid 49 \quad 1 \\
 0.000 \rightarrow \quad 2 \mid 24 \quad 0 \\
 \end{array}$$

$$\therefore (197)_{10} = (11000101)_2$$

Q:1. c) Convert the following numbers as directed.

i) Decimal 197.0625 into equivalent Binary & hexadecimal

Binary

$$\begin{array}{r} 2 | 197 \ 1 \\ 2 | 98 \ 0 \\ 2 | 49 \ 1 \\ 2 | 24 \ 0 \\ 2 | 12 \ 0 \\ 2 | 6 \ 0 \\ 2 | 3 \ 1 \\ 1 \end{array}$$

$$\begin{array}{l} 2 \times 0.0625 \rightarrow 0.1250 \ 0 \\ 2 \times 0.1250 \rightarrow 0.2500 \ 0 \\ 2 \times 0.2500 \rightarrow 0.5000 \ 0 \\ 2 \times 0.5000 \rightarrow 1.0000 \ 1 \end{array}$$

$$\therefore 197 = (11000101)_2$$

$$\therefore 0.0625 = (0.0001)_2$$

$$197.0625 = (11000101.0001)_2.$$

Hexadecimal

$$1100 \ 0101 \cdot 0001$$

$$C \cdot 5 \cdot 1 = (C5.1)_{16}$$

ii) Decimal 4567654 into binary and hexadecimal

Binary.

$$\begin{array}{r} 2 | 4567654 \ 0 \\ 2 | 2283827 \ 1 \\ 2 | 1141913 \ 1 \\ 2 | 570956 \ 0 \\ 2 | 285478 \ 0 \\ 2 | 142739 \ 1 \\ 2 | 71369 \ 1 \\ 2 | 35684 \ 0 \\ 2 | 12842 \ 0 \\ 2 | 6421 \ 1 \\ 2 | 3210 \ 0 \\ 1605 \end{array}$$

$$\begin{array}{r} 2 | 1605 \ 1 \\ 2 | 802 \ 0 \\ 2 | 401 \ 1 \\ 2 | 200 \ 0 \\ 2 | 100 \ 0 \\ 2 | 50 \ 0 \\ 2 | 25 \ 1 \\ 2 | 12 \ 0 \\ 2 | 6 \ 0 \\ 2 | 3 \ 1 \\ 1 \end{array}$$

$$\therefore (4567654)_{10} = (1100100010101001100110)_2 \#$$

Hexadecimal.

$$(0011\ 0010\ 0010\ 1010\ 1001\ 1001)_2$$

$$(0011\ 0010\ 0010\ 1010\ 0110\ 0110)_2$$

$$(322A66)_{16}$$

$$(4567654)_{10} = (322A66)_{16} \#$$

iii) String "Character codes of alphabets and special character \$ #" to ASCII code and Unicode.

A - 65 - $U+0041$	$K - 75 - U+004B$	$V - 85 - U+0055$
B - 66 - $U+0042$	$L - 76 - U+004C$	$W - 86 - U+0056$
C - 67 - $U+0043$	$M - 77 - U+004D$	$X - 87 - U+0057$
D - 68 - $U+0044$	$N - 78 - U+004E$	$Y - 88 - U+0058$
E - 69 - $U+0045$	$O - 79 - U+004F$	$Z - 89 - U+0059$
F - 70 - $U+0046$	$P - 80 - U+0050$	$# - 35 - U+0023$
G - 71 - $U+0047$	$Q - 81 - U+0051$	$$ - 36 - U+0024$
H - 72 - $U+0048$	$R - 82 - U+0052$	
I - 73 - $U+0049$	$S - 83 - U+0053$	
J - 74 - $U+004A$	$T - 84 - U+0054$	

iv) Hexadecimal ABCDFFED to decimal and binary

A B C D F F E D

$$(1010\ 1011\ 1100\ 1101\ 1111\ 1111\ 1110\ 1101)_2 = (ABCDFFED)_{16} \#$$

To decimal.

$$(ABCDFFFED)_{16}$$

$$= 16^7 \times A + 16^6 \times B + 16^5 \times C + 16^4 \times D + 16^3 \times F + 16^2 \times F + 16^1 \times E + 16^0 \times D$$

$$= 268435456 \times 10 + 1048576 \times 12 + 16777216 \times 11 + \\ 65536 \times 13 + 4096 \times 15 + 256 \times 15 + 16 \times 14 + 1 \times 13$$

$$= 2684354560 + 124579376 + 13500897$$

$$= (2882404333)_{10}$$

Ans

Q1. d) What is the need of ROM in a computer? How is it different to RAM? Why is Cache memory needed even if a computer has RAM and ROM? Why Secondary memory is needed?

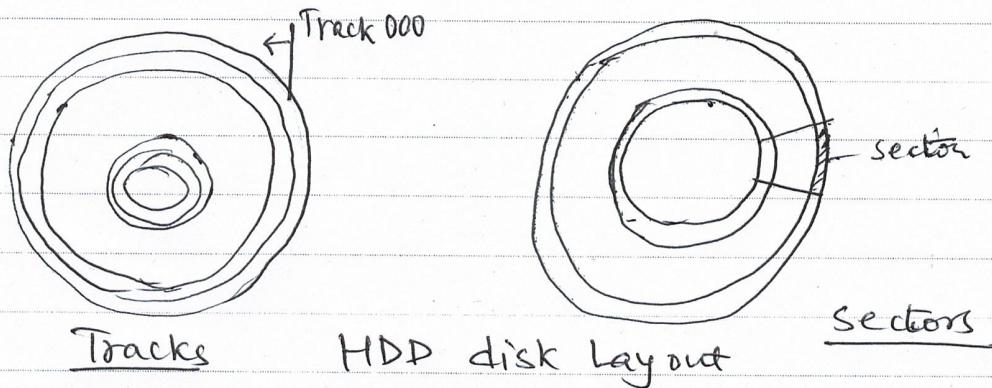
ROM is read only non volatile memory. It is not lost during power cut. It is permanently stored information. So, it is required or needed during computer startup and boot up for displaying product and producer's information.

It is different from RAM as it can only be read and not any information can be written.

Cache memory is the memory within the processor, it is required to enhance the speed of main memory. Cache memory is within processor, so easy & fast communication is established.

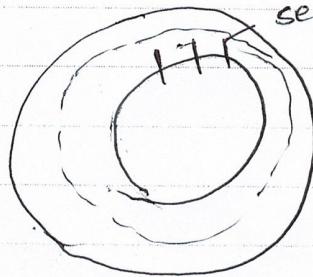
Secondary Memory is required to save and store the future needed information. It is used for mass storage as well as archival storage.

Q1 e) Explain the disk layout of Hard Disk and CD-ROM? Also explain the access time of magnetic disk and CD-ROM. Which of these has smaller access time?



There are sectors within each track. Data is stored within sectors. ~~There are also~~ The number of tracks on a disk ranges upto 800 and each track is divided into 10-100 sectors. These sectors can be either fixed or variable length sectors.

*sectors of equal length.*



CD-ROM disk Layout.

It has long spiral tracks to store data serially. The track is divided into block of same size called sectors.

In case of CD ROM for locating a desired address it needs to move to specific area, then adjust the rotating speed and read the address. After the conformation, it reads the data. So, it has ~~less~~ <sup>smaller higher</sup> access time than hard disk. As all these steps is not required in case of hard disk. It directly move to the address.

and starts to read the data.

So, HDD has smaller access time and is highly preferred for mass storage.

Q1. f) Compare and contrast the following technologies.

i) Parallel port and Serial Port.

Parallel port transfer 8 bits of a byte of data in parallel. It is mainly used for I/O devices for high speed data transmission.

Serial Port transfer 1 bit of a byte at a time as a single stream of bits. It is used for transmitting slow data over long distance. It has its uses on dial-up modems, serial mice etc.

ii) Mouse and light pen.

Mouse is a pointing input device widely used for GUI based OS.

Light pen is pen like sensitive input device to detect CRI beam when pointed towards the screen.

iii) Voice based input and Key board Input

Voice based input requires a microphone as input and requires another processing tool to recognize the voice & process it to a viable command.

Key board Input requires a key board as input. OS generally can easily track each key events.

iv) Inkjet Printers and Laser printers

Inkjet printers works by spraying controlled stream of tiny ink droplets accurately on the paper forming either dot matrix or solid characters. It works with a speed of 700 or more character per second.

Laser printers works on the principle of laser

light transmission creating image on the drum.  
It can print 10 - 200 pages per minute.

**Q.2 g)** Identify the software or type of software that will be required for the following situations. Also explain the steps that would be performed to solve the situation in question. If applicable.

i) A software development company maintains the list of tasks, expected time of completion of the tasks on which staff, people are working. Which software would help the company in planning and scheduling the projects.

MS Project; an Microsoft ~~has an~~ tool for project management can be a solution to the problem. ☺

iii) You want to judge the performance of each employee by finding the number of hours he/she has worked in last month. The employee attendance data (with in and out time) is available to you? This data is to be analyzed and suitable graphs are to be created to highlight individual work hours. Identify the suitable software and the features of the software that would be needed to create graphs.

MS Excel, its a tool which creates the required graph when we have required data.

ir) You are planning to apply for a job in at least 10 companies. You are required to create a letter for the HR management of each company. Identify which software and what feature of that software would be used by you. Explain these features.

MS word - Mail merge feature is required. In the feature we have to add all contact list and create a cover letter with dynamic content for contact parameters and use mail merge for generating document.

Pv) You are required to create a meeting information system for an organization. This system should setup meetings for different groups of employees informing them about meeting date, meeting agenda notes etc. What kind of software will you use for such work

Ms outlook's calendar Management feature would be of great use in this case.

Q.1. g) Explain the characteristics/functions of the following in the context of a computer system:

i) Proxy server

It is a server which acts as an intermediary between the client application and the web server. It is used for improving performance and for filtering purpose.

ii) Mother board.

It is a board comprising of all circuits and ports for connection to processors, RAM, I/O devices. It's the board which creates a platform for communication within the devices.

iii) Scandisk utility

It is a utility software to scan the disk health. It checks each sector and fixes if it has any problem.

iv) My documents

It's a default storage location created on windows OS. to save documents for archival use.

Q.2.

a) What are the key features of client/server architecture? What are the benefits of using client/server architecture? How is file sharing architecture different from client/server architecture?

In case of client/server architecture, the task or work load is divided into server program and client program (Requestor). A server is host and shares the resources with a client.

According to the application design for fat client or fat server, logic resides as required. The main feature of this architecture is we can design or develop a client or server both independently.

We can have both client and server application on a single computer which can help to reduce cost during less uses and can separate out if uses increases.

In case of file sharing architecture, <sup>we can</sup> ~~use the~~ shared file by other application at the same time. It may delay <sup>the process</sup> or throws error. But in case of client/server architecture, it is easier ~~to~~ handle such errors.

Q.2 b) Explain the characteristics of object-oriented programming? What are the advantages of using OOP?

The major characteristics of OOP can be listed as.

Encapsulation: Its to keep protective wrapper for the function or class for making them accessible within the limit.

Inheritance: Its the process of using all the logics of the inherited class. No need to rewrite the code.

Polymorphism: Different implementation of same function changing the parameter type is polymorphism. Method overloading ~~and~~ and overriding are a kind of polymorphism.

The main advantage is that we need not write the code again, if it is <sup>already</sup> done.

Q2. c. List and Explain the functions of the following in the context of software:

i) Types of Software Licensing

Mainly there are three types of software licensing on the basis of their use.

i) Individual License: It's a license provided to a person for single stand alone machine. It can be perpetual or subscription based. Eg. Microsoft Office personal license.

ii) Open Source License: It grants you the right to freely modify and redistribute the software.

iii) Commercial License: These are mostly for large enterprises that uses software for commercial purpose. There are different models of licensing for commercial use.

Traditional model, Transaction-based model,

Rental model & Technology partnership model.

Q.2. c. (ii) Software as a service.

Simply known as SaaS model is a software delivery model where customer can use the application as a service on demand and pay for it per usage. It is a type of renting application rather than buying. Cloud computing is one of the example.

iii) Diagnostic programs

A diagnostic program is a program written for the purpose of locating problems with software, hardware or both or a network of systems. It helps the user

to solve the issues arising. Some examples are Power-On Self Test (POST), MEM. EXE, Microsoft diagnostics etc.

#### iv) Perverse Software

It is a type of software which causes hindrance in other program execution, resulting modification or complete destruction of data without user's intention.

It is also known as Malicious software or malware.

Q2 d) Explain the following in the context of an Operating System.

#### i) Graphical User Interface and Command line interface.

GUI accepts command primarily in the form of drop down menus, mouse movements and mouse click while CLI relies on typed commands which provide direct access to various methods.

#### ii) Directory structure and its use in file Management.

Logical division of storage in the form of tree structure (parent-child) is basic directory structure. It provides an easy way to move files from one to others and protects file & limit file access.

#### iii) Input /output Services.

A specific software is designed to make an input or output device work on an operating system called device driver. These drivers accept I/O request and perform the actual data transfer between hardware and specified area of memory.

#### iv) Process management in multitasking OS

In multitasking operating system, OS determines which job will be admitted to the system and in what order.

The process is called job scheduling. Each process are divided into different threads which are individually

executable part of a process. It shares memory and all other resources with all other threads in the process but can be scheduled to run separately.

### v) Time sharing System

It is a multiprogramming system to share the processor time with other executing programs and users. There is sharing of processor's time with multiple user accessing the computer. It minimize the response time and commands are entered at the terminal.

### vi) Memory management in multi programming OS.

In multi programming OS, there are many programs running simultaneously which are accessing different memory locations. There are three major task of memory management in these system.

a) It should keep track of, memory parts currently in use and its corresponding process along with remaining available space.

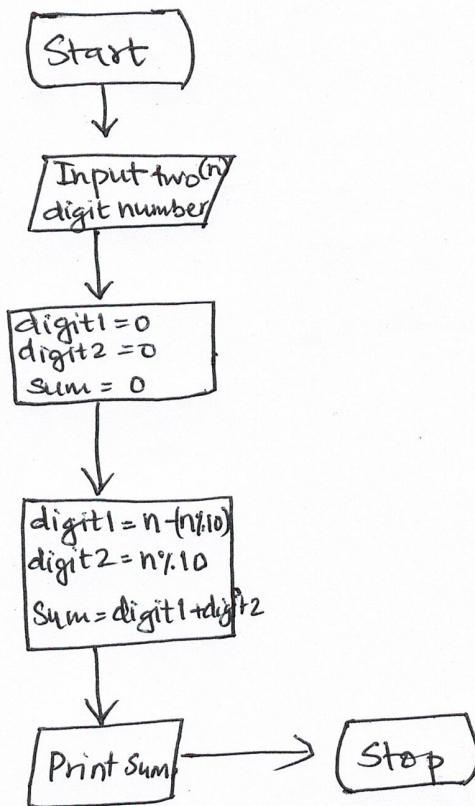
b) It should maintain the queue of programs and load the application to the memory once it is free based on criteria, priority and memory requirement.

c) It should allocate and delocate the programs in queue and which are completed.

Q2 e) Draw a flow chart and write an algorithm to find the sum of the digits of any two digit number given as input.

Algorithm to find sum of digits of a two digit number.

- Step 1. Read the number of two digits.(n)
- Step 2. Initialize digit1 = 0, digit2 = 0, sum = 0
- Step 3 Compute digit1 =  $n - (n \% 10)$
- Step 3 Compute digit2 =  $n \% 10$
- Step 4 Compute sum = digit1 + digit2
- Step 5 Display sum
- Step 6 END



Flow chart

Q.2 f) Explain the meaning and output of each line of the following program segment. How many times the loop at (ii) and (iii) will be executed

i)  $\text{int } n = 10;$   
 ii)  $\text{int } i, x = 1;$   
 iii)  $\text{for } (i=1; i \leq n; i=i+2)$   
 $\quad \quad \quad \{$   
 iv)  $x = x * i;$   
 $\quad \quad \quad \}$   
 v)  $\text{printf } ("The final value is \%d", x);$

and declaration

- i) It is initialization of variables  $n$ ,  $i$  and  $x$ .
- ii) It is looping statement. For loop with three segments first initialization ( $i=1$ ), second condition ( $i \leq n$ ) and third increment ( $i=i+2$ )
- iii) Statement within loop which repeats till the condition is true and changes the value of  $x$ . Value of  $x$  after loop is  $1 * 3 * 5 * 7 * 9 = 945$ .
- iv) It prints the statement "The final value is 945".

The loop will continue to 5 times changing the value of  $i$  to 1, 3, 5, 7 and 9.

Q3. a) What are the advantages of computer Networks? Explain the following terms in the context of computer networks:

Some advantages of computer networks can be listed as follows.

- Resource sharing : sharing of storage, input and output devices.
- High Reliability : Resource use as alternative source of supply.
- Cost benefit advantage; Resource sharing would always be a cost effective. Division of task among network would make the work easy and effective.
- Scalability : System Performance increases by adding more processors.
- Powerful communication medium; Network make cooperation among far-flung groups of people easy.

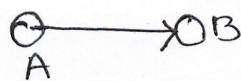
#### i) Mode of transmission,

Mode of data communication from one end to the other can be of three types.

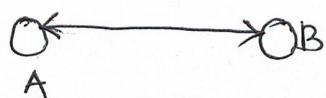
Simplex - One way from A to B



Half duplex - Only one at a time



Full duplex - both way simultaneously.



### ii) Packet and Circuit Switching

Switching offices having switches that were used to create connection from one source to destination involves circuit switching in telephone network. Packet switching is handing over message breaking it into many packets and sending to the destination and assembled to receive message at the destination.

### iii) Optical Fiber

It is a physical connection medium called guided media for transmission of data containing two concentric cylinder an inner core surrounded by cladding. It works on the principle of light reflection so called optical fiber.

### iv) Radio wave Transmission

It is transmission of signal without any physical media called unguided media with electromagnetic waves ranging in frequencies from 3 kilo hertz to 1 Giga Hertz. These waves are easy to generate and can travel long distance and can penetrate buildings easily.

Q3. b) Explain the characteristics of Bus topology and Ring topology. Also explain the characteristics of LAN and WAN. List one application of each of LAN and WAN.

#### Bus Topology

- i) It works on half-duplex mode of transmission.
- ii) A host on a bus network is called a station.
- iii) Every station will receive all network traffic and traffic generated by each station has equal transmission priority.

### Ring topology

Every node is connected to its left and right side nodes in which the information is travel from node to node in a ring manner in one direction. In ring topology, to add a new node the entire connection must be broken down.

### LAN (Characteristics)

- i) Computers are connected in a local geographical location.
- ii) Work stations have either physical or wireless network connections.
- iii) Peripherals are often shared
- iv) Software and data can be shared.

### WAN (Characteristics)

- i) WAN has an enormous capacity and connects a large number of computers connected over a large geographical area.
- ii) WAN provides connecting links between LAN and MAN to the network.
- iii) Applications and other resources can be shared with other users on the internet like LAN.
- iv) Software and data can be shared.

Q3. c) Explain the function of the following in the context of networking.

#### i) Modem

It is a communication device that converts binary signal into analog signals for transmission over telephone lines and converts back to binary from receiving end. It was used for internet connection.

### ii) Network Interface Cards.

It provides the physical connection between the network and the computer. Example of NIC is Ethernet cards. It has RJ-45 connection port. It's the main medium for LAN.

### iii) Repeaters

A repeater is a device that electrically amplifies the signal it receives and re-broadcasts it. It helps in making a connection smooth for ~~tense with~~ MAN or LAN.

### iv) OSI model

It is a model of data transmission through different seven layers application, presentation, session, transport, network, data link and physical. It is communication mechanism for data sharing.

Q.3 d) What is URL and IP Address? How are they related? How URL can be converted to an IP address? Explain with the help of an example. Explain how a

subnet mask 255.255.255.0 will be able to help in identifying various components of an IP address.

URL - Uniform Resource Locator is the global address of a document or resource on the WWW.

IP Address - It is <sup>unique</sup> address of the computer. ~~separated by dot.~~

It is a series of four numbers separated by dot. (.) All the four number ranges between 0 - 255.

Each URL refers to a unique IP Address of a computer. Instead of using complex IP address DNS is preferred to use.

We need to register domain with our IP address. For example `www.ignou.ac.in` is URL and its corresponding IP address is `192.168.1.247`. Whenever the url is used, it routes its traffic to the IP and response is provided back to the client.

Subnet mask for Local Area Network(LAN) is `255.255.255.0` while it is `255.255.0.0` for remote.

Q3. f) Explain the following in the context of Internet and its applications:

i) E-mail

It is electronic letter sending process to communicate. Email is one of the ways on internet to send messages to another person across the network.

It has changed the way of messaging. It is not affected by distance or road blockage etc. It can be sent anywhere in the world. We also can send video and audio with the email.

ii) Collaborations.

It is the act or process of working together on a project or some intellectual activity. The world is increasing becoming globalized on issues like environment protection, control of terrorism, international business, learning etc. Collaborative approach in these issues is required. Internet has facilitated to work on these issues from different countries without the hindrance of national and international boundaries.

Q3 e) What is search engine? What are the basic actions performed by a search engine? Explain. What would be search terms if you are looking forward to the following.

- i) List of Universities offering PhD Programme in Computer Science.
- ii) List of Browsing software.

A search engine can be defined as a tool to search diverse and disorganized sources of information available on the internet. It has to use some automated programs that needs to continuously keep visiting the web pages about the content they have and organize the information about web pages in some format. Search engine finds, classifies and stores information about the contents of various websites on the internet.

Search terms

- i) "Universities", "PhD Programme", "Computer Science" are the key words which would be searched
- ii) "Browsing", "Software",