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

groups of bits called words. The internal structure structure of a memory unit is specified by the number of words it contains and the number of bits in each words.

(b) Different standards of represting character in a computer

ASCII (American Standard code for Inform Interchange)

UTF-32 (Unicode Transformation Format 32-bit)

UTF-16 (Unicode Transformation Format 16-Bit

ASCII

ASCII uses seven bits, giveng a character set of 128 characters. The characters are represent in a table called the ASCII table. The 128 characters include:

- 32 control codes (mainly to do with Bunting)
- 32 Punctuation codes, Symbol, and Space
- 26 Upper-case letters

INDIRA GANDHI NATIONAL OPEN UNIVERSITY
REGIONAL CENTRE DELHI-1

Assignment Submission for Term End Exam December - 2020

(Please read the instructions given below carefully before submitting assignments)

1. Name of the Student : Parsh Sharma
2. Enrollment Number : 2215652356
3. Programme Code : BCA
4. Course Code : BCS-011
5. Study Centre Code : 07162(P)
6. Name of the Study Centre With complete address : Mohal Education and research Institute of Tech(MERIT). A9 Qutub Institutional area USO Rd, Near JNU New Delhi 110067
7. Mobile Number : 8700426536
8. E-mail ID : xPredator82021@gmail.com
9. Above information is cross checked and it is correct: Yes/No

(The same details should also be filled up by the students in the google form, any mismatch in the form may result in rejection of assignment)

Date of Submission 27/11/22

Parsh Sharma

(Signature of the student)

A. General Instructions:-

1. Please do not send any assignment at any email of the Regional Centre Delhi-1, it will not be considered. No email in this regard will be responded individually.
2. Please write your name and enrollment no at the bottom of each page of your assignment.
3. Please retain ORIGINAL ASSIGNMENT submitted with you for record and also keep the assignment submission Email receipt automatically generated and received in your email given by you in google form in your safe custody. No other submission receipt will be given in this regard for online submission.
4. Please ensure that single legible PDF file is submitted for one course and it is successfully uploaded so that it may be downloaded for evaluation.

B. Assignment PDF file (10MB maximum should have following components in the the sequence given:

1. Copy of IGNOU Identity Card
2. Second page should be this document as Annexure-I.
3. Copy of valid/applicable assignment question paper attempted by you.
4. Hand written Assignments.

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मैदान गढ़ी, नई दिल्ली - 110068
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Maidan Garhi,New Delhi - 110068

IGNOU - Student Identity Card

Enrolment Number : 2251652356

RC Code :	07: DELHI 1 (MOHAN ESTATE (SOUTH DELHI))
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Name :	SPARSH SHARMA
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1. This card should be produced on demand at the Study Center, Examination Center or any other Establishment of IGNOU to use its facilities.
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Registrar
Student Registration Division

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

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) **(7×4=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);

(ii) List of Browsing software.

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

(i) E-mail

(ii) Collaborations

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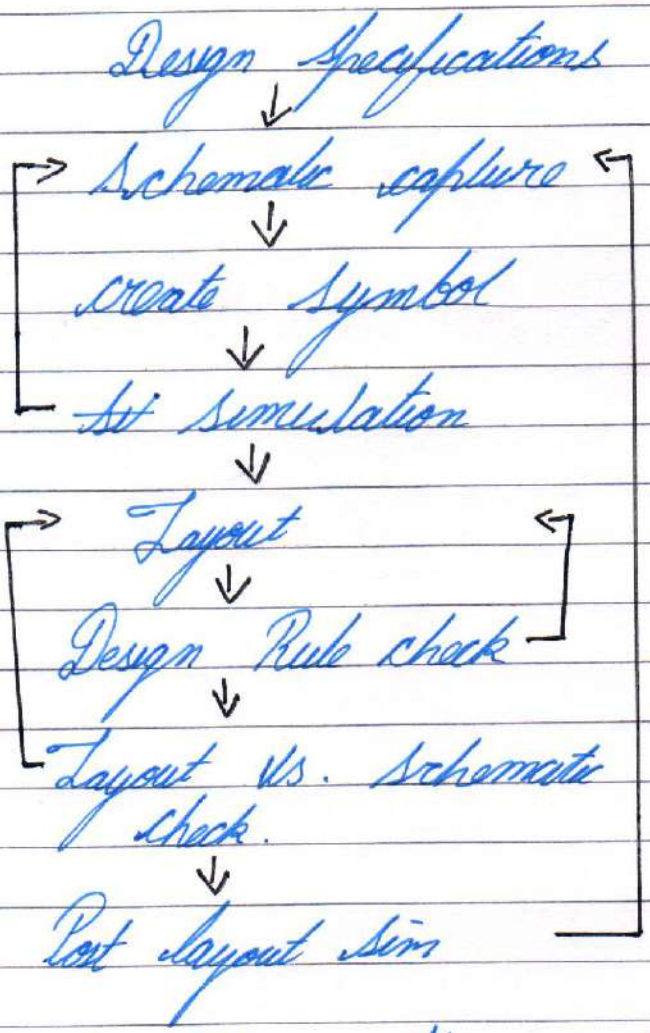
Q! What is VLSI? How did it come. change the design of a computer system? Explain the working of Von Neumann Architecture with the help of diagram Also explain the process of execution of an instruction for a Von Neumann Machine.

Ans VLSI: (Very Large scale Integration) is one of the most widely used technologies for microchip processors, integrated circuits (IC) and component designing. It was initially designed to support hundreds of thousands of transistor gets on a microchip which as of 2012, exceeded several million. All of these transistors are remarkably integrated and embered with in a microchip that has shrunk over time but still has the capacity to hold enormous amount of transistors.

The first 1 mega byte RAM was built on top of VLSI design principals and included more than one million transistor on it microchips dye.

The VLSI IC circuits design flow in the figures below. The various levels of design are numbered and the blocks show processes in design flow.

specification done first, they describe as abstractly, the functionality, interface and the architecture of the digital IC circuit to be designed.



Behavioral discription is then created to analyze the design in term of functionality, performance compliance to given standards, and other specifications

RTL discription is done using HDL's. This RTL discription is simulated to test functionality

from here onwards we need the help of EDA tools

RTL description is then converted to a gate-level netlist using logic synthesis tools. A gatelevel netlist is a description of the circuit in terms of gates and connections between them, which are made in such a way that they meet the timing, power and area specifications

Finally, a physical layout is made, which will be Verified and then sent to fabrication

Von-Neumann proposed his computer architecture design in 1945 which was later known as Von-Neumann Architecture. It is a design model for the morden computers which has central processing unit (CPU) and the concept of making memory used for for both data and instructions. The model implements the storage program concept in which the data and the instructions both are stored in the memory. All computer share the same basic architecture which have same memory, an I/O system, arithmetic logic unit (ALU) and control unit (CU)

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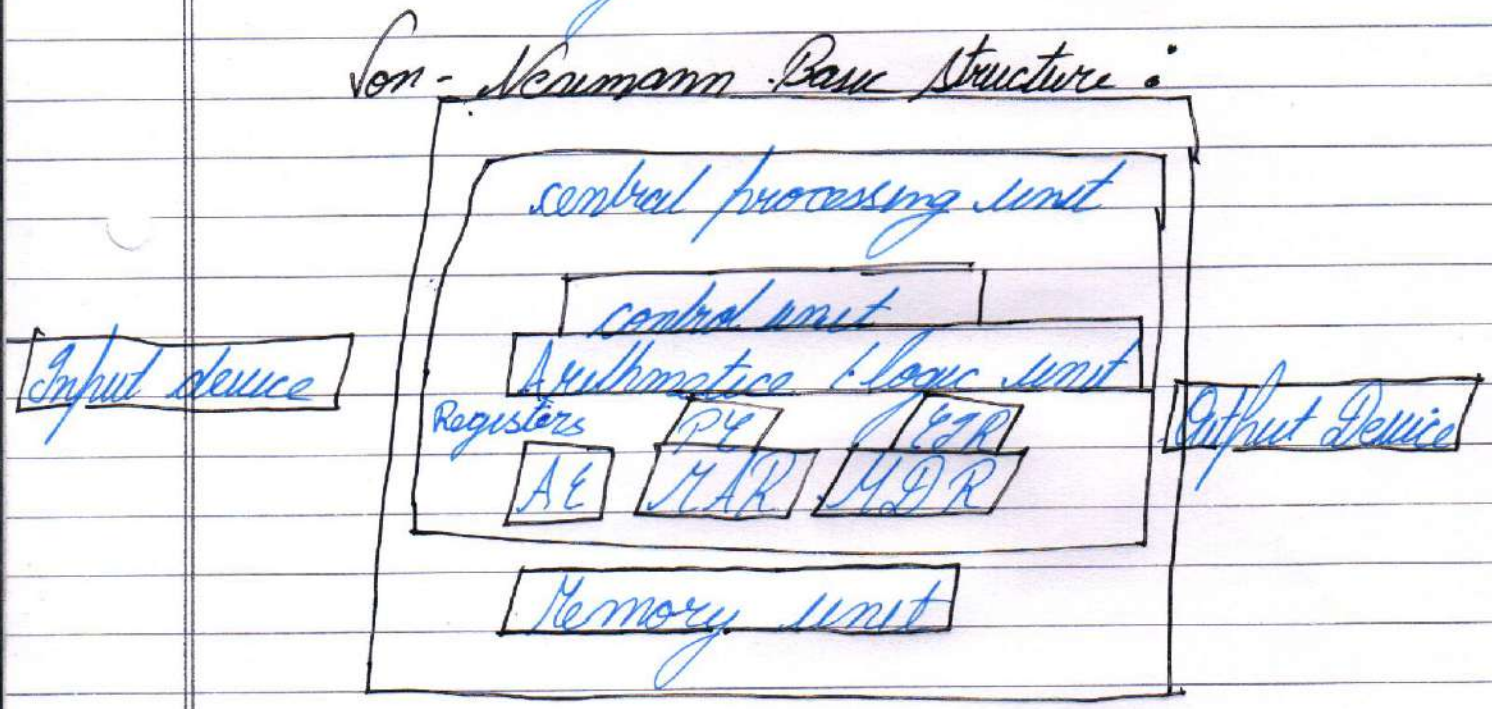
Von Neumann architecture is based on the stored-program computer concept, where instruction data and program data are stored in the same memory. This design is still used in most computers produced today.

A Von Neuman-based computer
- Uses a single processor
- Uses one memory for both instruction and data.
- Executes programs following the fetch-decode-execute cycle

Von-Neumann Basic Structure:



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process of execution by Von Neuman Archite

Von Neumann Architecture is based on the following three components

central processing unit
Buses
Memory Unit

central processing unit

The part of the computer that performs the bulk of data processing operations is called the central processing unit

The central processing unit can also be defined as an electrical responsible for executing the instructions of a computer program.

The cpu performs a variety of functions directed by the type of instructions that are incorporated in the computer.

The major components of CPU are Arithmetic and logical Unit (, control Unit and a variety of registers

(i) Arithmetic and logic unit (ALU)

The arithmetic and logical unit performs the required micro-operations for executing the instruction. In simple words, ALU allows arithmetic (add, subtract etc) and logic (And OR, NOT, etc) operations to be carried out.

(ii) Control unit

The control unit of a computer system controls the operations of components like ALU, memory and Input/Output devices

The control unit consists of a program counter that contains the address of the instructions to be fetched and an instruction register into which instruction are fetched from memory for execution.

(iii) Registers

Registers refers to high speed storage area in the CPU. The data processed by the CPU are fetched from the registers

Following is the list of registers that plays a crucial role in data processing.

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Registers	Description
MAR (Memory Address Registers)	This Registers hold the memory location of the data that needs to be accessed.
MDR (Memory Data Registers)	This Registers hold the data that is being transferred to or from memory
A (Accumulator)	This register holds the intermediate arithmetic and logic result.
PC (Program counter)	This register contains the address of the next instruction to be executed.
CIR (current Instruction Register)	This register contain the current instruction during processing.

Buses

Buses are the means by which information is shared between the registers in a multiple-register configration System.

A bus structure consists of a set a of common

lines; one of the- for each bit of a register, through which binary information is transferred one at a time. Control Signals determine which register is selected by the bus during each particular register transfer.

Von-Neumann Architecture comprised of three major bus systems for data transfer

Bus	Description
Address Bus	Address Bus carries the address of data (but not the data) between the processor and the memory.
Data Bus	Data Bus carries data between the processor, the memory unit and the input/output devices.
Control Bus	Control Bus carries Signals/commands from the CPU.

Memory unit

A memory unit is a collection of storage cells together with association circuits / needs to transfer information in and out of the storage The memory stores binary information in

00000000 to 0010ffff for eg the String ABC in UTF-32 is encoded as
x"000 000 041 000 000 042 000 000 043

List the ASCII Code of all the decimal digits :

ASCII Character	Decimal
Null	0
SOH	1
STX	2
ETX	3
EOT	4
ENQ	5
ACK	6
BELL	7
BS	8
TAB	9

(C)

(1) Decimal 197.0625 into equivalent binary:

In 197.0625 Whole number Part = 197 and fractional part = 0.0625

First Converting Whole number Part (i.e 197)

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When data is stored or transmitted its ASCII or unicode number is used, not the character itself

For Example, the word "Computer" would be represented as:

1000011 1101111 1101101 1100000 1110100 1100101 1110010

UTF-32

UTF-32 is an encoding to unicode in which each character is composed of 4 bits.

unicode was originally designed as a pure 16-bit encoding, aimed at representing all modern scripts. Over time, and especially after the addition of over 14,500 composite characters for compatibility with established sets, it became clear that 16 bits were not sufficient for many users. Out of this arose UTF-32

This allow characters to be encoded as 4 bytes at any code point from

Numberic digital 0-9

We usually tend to say that the letter 'A' is the first letter of the alphabet. 'B' is the second and so-on, all the way up to Z which is the 26th letter. In ASCII, each character has its own assigned number.

Character	Denary	Binary	Hexadem
A	65	1000001	41
Z	90	1011010	5A
a	97	1100001	61
z	122	1111010	7A
0	48	0110000	30
9	57	0111001	39
Space	32	0100000	20
!	33	0100001	21

A is represented by the denary number 65 (binary 1000001, hexadecimal 41) B by 66 (binary 1000010; hexadecimal 42) and so on upto z which represented by the denary number 90 (binary 1011010, hexadecimal 5A) Similarly, lower-case letter start at denary 97 (binary 1100001 hexadecimal 61) and end at denary 122 (binary 1111010, hexadecimal 7A).

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		Remainders
2	197	1
2	98	0
2	49	1
2	24	0
2	12	0
2	6	0
2	3	1
2	1	1
	0	

Therefore, $(197)_{10} = (11000101)_2$

converting fractional part (i.e., 0.0625

$0.0625 \times 2 \Rightarrow 0.1250$
$0.1250 \times 2 \Rightarrow 0.2500$
$0.2500 \times 2 \Rightarrow 0.5000$
$0.5000 \times 2 \Rightarrow 1.0000$

Therefore, $(0.0625)_{10} = (0.0001)_2$

Hence, $(197.0625)_{10} = (11000101)_2 + (0.0001)_2$
$= (11000101.0001)_2$ Ans

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Decimal 197.0625 into equivalent hexadecim

In 197.0625 whole number part = 197
and fractional part = 0.0625

first converting whole number part (i.e 197)

		Remainds
16	197	5
16	12	C
	0	

$\therefore (197)_{10} = (C5)_{16}$

Converting fractional part (i.e., 0.0625)

$0.0625 \times 16 = 1.0000$
$\therefore (0.0625)_{10} = (0.1)_{16}$
Hence, $(197.0625)_{10} = (C5)_{16} + (0.1)_{16} = (C5.1)_{16}$

ii) Decimal 4567654 into binary:

2	4567654	0
2	2283827	1
2	1141913	1
2	570956	0
2	285478	0
2	142739	1
2	71369	1