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Que What is digital computer? Functionalty.

Ans- Computer :- A computer is an electronic device, operating under the control of instructions stored in its own memory that can accept data (input), process the data according to specified rules, produce information (output), and store the information for future use.

Functionalities

Any digital computer carries out five functions in gross terms:

- Takes data as input.
- Stores the data / instructions in its memory and use them when required.
- Processes the data and converts it into useful information.
- Generates the output
- Controls all the above four steps.

Que- Differentiate hardware and software?

Ans- Hardware :- Computer hardware is the collection of physical elements "Tangible objects" that constitutes a computer system. The actual machinery, wires, transistors and circuits etc.

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Software :- Software is a generic terms for organized collections of computer data and instructions.

Que- Differentiate between system software and application software.

Ans:- System software :- Also known as Operating System. It is responsible for controlling, integrating, and managing the individual hardware components of a computer system.

Example - Microsoft windows, Linux, Unix, Mac OSX, DOS

Application software :- Application software, also known as an application or an "app" is computer software designed to help the user to perform specific tasks

Example - 1. Opera (web Browser)
2. Microsoft word (word processing)
3. Microsoft Excel (Spreadsheet software)
4. MySQL (Database software)
5. Microsoft Powerpoint (presentation software)
6. Adobe photoshop (Graphics software

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* Application software cannot run without the presence of the system software although System software can run independently of the application software.

Que- Differentiate between among RAM, ROM and HDD

Ans-

RAM	ROM	HDD
• RAM stands for Random Access Memory.	ROM stands for Read only Memory.	HDD Stands for Hard DISK Drive.
• It is a high-speed memory.	It is much slower than the RAM.	It is much much slower that RAM and ROM.
• RAM is a volatile memory which could store the data as long as the power is supplied.	It is non-volatile memory which could retain th data even when power is turned off.	It is also volatile but it can retain their data for 9-20 years.
• Data stored in it can be retrieved and altered.	Data stored in it can only be read.	Data stored in it can be retrieved.
• The CPU can access the data stored on it directly.	The CPU not access data stored on it unless the data is stored in RAM	The CPU not access the data on it unless the data is stored in RAM

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• Used to store the data that has to be currently processed by CPU temporily • In RAM each and every element takes same time to be accessed.	It stores the instruction required during bootstrap of the computer	It stores all digital content, documents picture, videos, programs applications. In HDD different elements take different time to be accessed.

Que-5 Explain the components of computer.

Ans- There are five basic components computer

1. Input Unit
2. Central processing unit
3. Primary memory Unit
4. Secondary Storage Unit
5. Output Unit

1. Input Unit - Input device is any peripheral (piece of computer hardware) equipment to provide data and control signals to an information processing system such as a computer or other information appliance.

Input device translate data from form that humans understand to one that the computer can work with most

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common are Keyboard and Mouse

2. Central processing Unit (CPU) :- It is known as microprocessor or processor. It is the brain of computer. CPU performs all types of data processing operations. It stores data, intermediate results, and instructions. It controls the operation of all parts of the computer.
CPU has three components
1. ALU (Arithmetic logic Unit)
2. CU (control Unit)
3. Registers.

3. Primary Memory :- Primary memory is computer memory that a processor or computer accesses first or directly. It allows a processor to access running execution applications and services that are temporarily stored in a specific memory location.

Secondary storage Unit :- It is non-volatile log term storage it stores data and program. It retained after the power is turned off
Example- Hard Disk, optical Disk, Flash memory

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5. Output Unit :- An output device is any piece of computer hardware equipment used to communicate the results of data processing carried out by an information processing system. "Converts the electronically generated information into human-readable form.

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Qu-6 Explain compiler, Assembler, Linker, Loader.

Ans- Compiler: Compiler is a software which converts a program written in high level language (source language) to low level language (machine language).

Assembler: An assembler is a program that takes basic computer instructions and converts them into a pattern of bits that the computer's processor can use to perform its basic operations.

Linker: A linker is a computer system program that takes one or more object files (generated by a compiler or assembler) and combines them into a single executable file.

Loader:- The loader is a special program that takes input of object code from linker, loads it to main memory, and prepares this code for execution by computer.

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Que-7 Explain the compilation and execution of C program in linux enviroment

Ans- We can compile the program by using gcc compiler in Linux enviroment

1. Install the compiler.
2. Write the program using any editor (graphical, console)
3. Save the written program is a file as 'filename.C'
4. Compile the program as 'gcc filename.C' or we can also compile as gcc filename.c -o filename
5. It execute an exe file as ./a.out or ./filename where the programs run

Que-8 Differentiate High level language & Low level language.

Ans-

	High level language	Low level language
1.	It is programmer friendly language	It is a machine friendly language
2.	It is less memory efficient.	It is high memory efficient
3.	It is easy to understand	It is tough to understand
4.	It is simple to debug.	It is complex to debug
5.	It is simple to maintain	It is complex to maintain

6.	It is portable.	It is non-portable.
7.	It can run on any platform	It is machine-dependent.
8.	It needs compiler or interpreter for translation	It needs assembler for translation.
9.	It is used widely for programming	It is not commonly used now-a-days in programming.

Que-9 Differentiate between compiler & interpreter.

Ans-

	Compiler	Interpreter
1.	Compiler scans the whole program in one go.	Translates program one statement at a time.
2.	The errors (if any) are shown at the end together	Errors are shown line by line
3.	Main advantage of compilers is it's execution time	Due to interpreters being slow in executing the object code it is preferred less.
4.	It converts the source code into object code.	It does not convert source code into object code instead it scans it line by line
5.	It does not require source code for later execution	It requires source code for later execution
E.g.	C, C++, C# etc	Python, Ruby, Perl, SNOBOL, MATLAB etc.

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Qu1-10 What is an Algorithm? write the characterstics of algorithm.

Ans- An algorithm is a sequence of steps that describe solution of problem

Characterstics of Algorithm

1. It should have well defined inputs and well-defined outputs also.
2. Algorithm should be clear and unambiguous. Each of its steps should be clear in all aspects and must lead to only one meaning
3. The algorithm mut be finite, i.e. it should not end up in an infinite loops or similar.
4. The algorithm must be simple, generic and practical, such that it can be executed upon with the available resources
5. The algorithm designed must be language-independent, i.e. it must be just plain instructions that can be implemented in any language and yet the output will be same, as expected.

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Qu-11 Write an algo for leap year.

Ans- Step 1 - Take a integer variable year
Step 2 - Assign value to the variable
Step 3 - check if year is divisible by 4 but not 100, Display "leap year"
Step 4 - check if year is divisible by 400. Display "leap year"
Step 5 - otherwise display "not leap year"

Qu-12 Write an algo for prime number.

Ans- Step 1 - Take a integer variable num
Step 2 - Assign value to the variable.
Step 3 - Divide the variable num with (num-1 to 2)
Step 4 - If num is divisible by any value (num-1 to 2) then it is "not prime"
Step 5 - Else it is 'prime'

Qu-13 Explain Stepwise refinement.

Ans - Step wise refinement is the idea that program is developed by moving the levels of abstraction, beginning at higher levels and, incrementally refining the program through each level of abstraction providing more detail at each increment.

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Que-14 Explain the designing and implementation of correct, efficient & maintainable program.

Ans- Design: In this a plan of action is made before the actual development process. Moreover in the design phase the core structure of the software or program is broken down in to modules. The solution of program is then specified for each module in the form of algorithms.

Implementation: In this phase, the designed algorithms are converted in to program code using any of the high level languages. and all design phase documentation is implemented into code in this phase

Que-15 What is structured programing?

Ans- Structured programing is a programing paradingm aimed at improving the ~~to~~ clarity, quality, and development time of a computer program by making extensive use of the structured control flow constructs of selection and repetition, block structures and subroutines.

Que-17 Convert $(231)_4$ to Base 3

$$(231)_4 = 2\times4^2 + 3\times4^1 + 1\times4^0$$
$$= (45)_{10}$$

$$(45)_{10} = 1\times3^3 + 2\times3^2 + 0\times3^1 + 0\times3^0$$
$$= (1200)_3$$ Ans

Que-18 $(567)_8$ to Base 2

$$(567)_8 = 5\times8^2 + 6\times8^1 + 7\times8^0$$
$$= (375)_{10}$$

$$(375)_{10} = 1\times2^8 + 0\times2^7 + 1\times2^6 + 1\times2^5 + 1\times2^4 + 0\times2^3 + 1\times2^2 + 1\times2^1 + 1\times2^0$$

$$= 101110111$$

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Qu-19 $(DD)_{16} + (9E)_{16} = (\ )_9$ & Base 16

$(DD)_{16} = (221)_{10}$

$(9E)_{19} = (158)_{10}$

$221 + 158 = 379$

$(379)_{10} = 4 \times 9^2 + 6 \times 9^1 + 1 \times 9^0$

$= (461)_9$

$(379)_{10} = 1 \times 16^2 + 7 \times 16^1 + 11 \times 16^0$

$= (17B)_{16}$

Qu-21 $(472)_8$ to Base 10

$(472)_8 = 4 \times 8^2 + 7 \times 8^1 + 2 \times 8^0$

$= (314)_{10}$

Qu-22 $(AD)_{16} + (9E)_{16} = (\ )_{16}$

$(AD)_{16} = (173)_{10}$

$(9E)_{19} = (158)_{10}$

$(AD)_{16} + (9E)_{16} = (331)_{10}$

$(331)_{10} = 1 \times 16^2 + 4 \times 16^1 + 11 \times 16^0$

$= (14B)_{16}$

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Que-23 convert 1100001101010001010011011 into base 8

001 100 001 101 010 001 010 010 111 011
1 4 1 5 2 1 2 2 7 3

= $(1415212273)_8$

Que-24 Convert 101001010001111111000000011110101O into hex

0001 0100 1010 0011 1111 0000 0001 1110 1010
1 4 10 3 15 0 1 14 10

= $(14A3F01EA)_{16}$