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Answers Key:

SECTION - E (5 Marks)

1. (i) Open source is a philosophy that promotes the free access and distribution of an end product, usually software or a program
   (ii) **Criteria for Open Source Software:**
   The Open source definition outlines several criteria for software to be considered open source:
   Free Redistribution: The software can be freely distributed without restrictions.
   Source Code: The source code must be accessible to users.
   Derived Works: Users should be able to create and distribute modified versions of the software under the same licensing terms.
   Integrity of the Author's Source Code: The license should protect the original author's rights and prevent unauthorized modifications from being distributed as the original.
   No Discrimination: The license should not discriminate against individuals, groups, or fields of endeavor.
   Distribution of License: The license should be distributed with the software.
   (iii) **Programmers' Contributions to the Open Source Community:**
   Programmers contribute to open source in various ways:
   Code Contributions:
   They can directly modify the source code, fix bugs, and add new features.
   Code Review:
   They can review code submitted by others, providing feedback and ensuring code quality.
   Testing and Quality Assurance:
   They can test the software and report bugs, helping to improve its stability and reliability.
   Community Engagement:
   They can participate in forums, mailing lists, and other channels to discuss the software, provide support, and contribute to the community.
   Documentation:
   They can contribute to the documentation of the software, making it easier for others to use and understand.
   (iv) **Examples of Open Source Software**:
   Linux: A widely used operating system kernel.
   Mozilla Firefox: A popular web browser.
   GIMP: An image manipulation program.
   Appache HTTP Server: A widely used web server.
   Python: A popular programming language.
   Libre Office: A suite of office applications.
2. c)(A) is true but (R) is false
3. a)Both (A)and (R) are true and (R) is the correct explanation of (A)
4. c)Statement (I) is true, but Statement (II) is false.

SECTION - D (4 Marks)

5. Speed, accuracy, diligence, storage capability and versatility are some of the key characteristic of a computer. A brief overview of these characteristics are:
   (i) Speed: The computer can process data very fast, with the rate of millions of instructions per second. Some calculations that would have taken hours and days to complete otherwise, can be completed in a few seconds using() the computer.
   (ii) Accuracy: Computer provides a high degree of accuracy. For example : the computer can accurately give the result of division of any two numbers up to 30 decimal places.
   (iii) Diligence : When used for a longer period of time, the computer does not get tired or fatigued. It can perform long and complex calculations with the same speed and accuracy from the start till the end.
   (iv) Storage Capability: Large volumes of data and information can be stored in the computer and also retrieved whenever required. A limited amount of data can be stored temporarily in the primary memory. Secondary storage devices like DVD and compact disk can store a large amount of data permanently.
6. Computer memory are internal storage areas in the computer used to either temporarily or permanently store data or instructions to be processed. There are four basic types of computer memory. Cache Memory, RAM, Virtual Memory and Hard Drives. With modern CPU's running at speeds of 1 gigahertz or higher, it is hard for computer memory to keep up with the extreme amount of data being processed. Computer engineers fixed the problem by "tiring" memory. By using this tiring effect, engineers use a small amount of more expensive memory and a large amount of low cost memory.
7. The design of a pen drive makes it easy to fit almost anywhere. They can store a large amount of information, sometimes as large as 32 Gigabytes. Almost all computers that are designed today have a USB port that allows for extra drives to be attached to access other information on other computer hardware accessories.
8. A CPU cache is a memory used by the Central Processing Unit (CPU) of a computer to reduce the average time to access data from the main memory. The cache is a smaller and faster memory which stores copies of the data from frequently used main memory locations. Most CPUs have different independent caches, including instructions and data caches, where the data cache is usually organized as a hierarchy of more cache levels (L1, L2, etc.)
   When the processor needs to read from or write to a location in main memory, it first checks whether a copy of that data reside in the cache. If so, the processor immediately reads from or writes to the cache, which is much faster than reading from or writing to main memory.
   Most modern desktop and server CPUs have at least three independent caches : an instruction cache to seed up executable instruction fetch, a data cache

to speed up data fetch and store, and a translation look aside buffer (TLB)used to speed up virtual - to physical address translation for both executable instructions and data. The data cache is usually organized as a hierarchy of more cache level 1.

9.

DRAM	SRAM
(i) A DRAM cell consists of only one transistor and one capacitor.	A SRAM consists of internal flip-flops
(ii) It has large number of cells packed within the chip.	The number of cells on a SRAM chip is less.
(iii) It needs to be refreshed (about thousand times in a second) to retain the stored data	It retains data as long as the power is supplied to thousand i.e. there is no need to refresh it.
(iv) DRAMs areused in primary storage sections of most computers.	SRAMs are used is specialized applications.

10. Python's features include -

i) Easy-to-Iearn - Python has few keywords, simple structure, and a clearly defined syntax. This allows the student to pick up the language quickly.
ii)Easy-to-read - Python code is more clearly defined and visible to the eyes.
iii) Easy-to-maintain - Python-s source code is fairlyeasy-to-maintain.
iv) A broad standard library - Python-s bulk of the library is very portable and cross-platform compatible on UNIX,Windows, and Macintosh.
v) Interactive Mode -:- Python has support for an interactive mode which allows interactive testing and debugging of snippets of code.
vi) Portable - Python can run on a wide variety of hardware platforms and has the same interface on all platforms.
vii)Extendable - You can add low-level modules to the Python interpreter. These modules enable programmers to add to or customize their tools to be more efficient.
viii) Databases - Python provides interfaces to all major commercial databases.
ix) GUI Programming - Python supports GUI applications that can be created and ported to many system calls, libraries and windows systems, such as Windows MFC, Macintosh, and the XWindow system of Unix.
x) Scalable - Python provides a better structure and support for large programs than shell scripting.

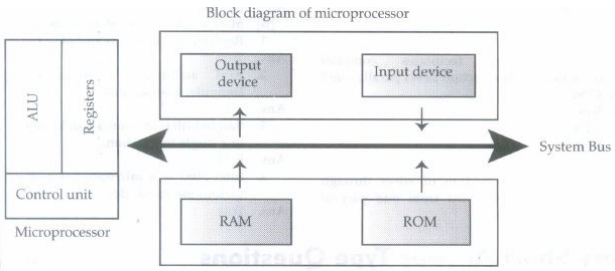
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SECTION - C (3 Marks)

11. Memory Unit stores the data, instructions, intermediate results and output temporarily, during the processing of data. This memory is also called the main memory of primary memory of the computer. The input data that is to be processed is brought into the main memory before processing.

12. A computer is an electronic device which can perform various operations accurately and fast. For example data processing, huge calculations etc.
Characteristics of computer:
(i) Speed: It speed is very fast.A modern computer can execute millions of instructions in one second.
(ii) Accuracy: A computer can give accurate results up to 20 to 30 places of decimal.
(iii) High storage capacity: A computer can store large amount of data in very small space.
(iv) Versatility: A computer can do different types of tasks like data processing, graphics, audio and visual effects.
(v) Repetitive: A computer makes no mistake in repeating anything as many times

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14. 

15. A microprocessor is a computer processor that incorporates the functions of a CPU on a single integrated circuit (IC).
Components of Microprocessor:
1. CPU
2. I/O units
3. Register
4. Cache

SECTION - B (2 Marks)

16. An identifier starts with a letter A to Z or a to z or an underscore (_) followed by zero or more letters, underscores and digits (0 to 9).
Python does not allow punctuation characters such as @, $, and % within identifiers. Python is a case sensitive programming language. Thus, Count and count are two different identifiers in Python.

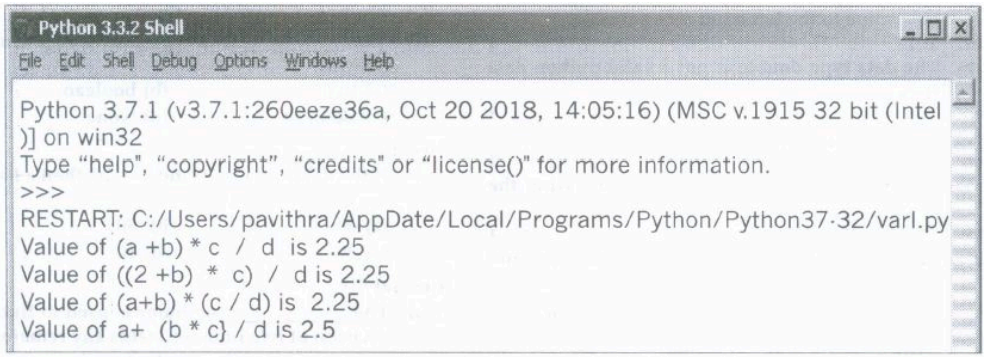
17. Assigning same value to multiple variables:
We can assign same value to multiple variables:
Example: a=b=c=10
Assigning Multiple values to multiple variables:
Wecan assign multiple values to multiple variables in single statement e.g. X, Y,Z=10, 20, 30 It will assign the values order wise, i.e. first variable is given first value, second variable the second value and so on.

18. (a) **try** - It's a keyword and can't be used as a variable name
(b) **123Hello** - Variable names can't start with a digit
(c) **abc@d** - Special characters aren't allowed in variable names.

19. To represent real-life da ta programming languages offer ways to handle them. These are called data types.
Python's datatypes are:
(i) Numbers
(ii) String
(iii) List
(iv) Tuple
(v) Dictionary

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20. The various number types are Integers, Floating point, Boolean, complex numbers

21. 

22. (i) 14
(ii) 10
(ii) 14

23. 2.0

24. False
True
False

25. Immutable means unchangeable. In Python, immutable types are those whose values cannot be changed in place. Whenever one assigns a new value to a variable referring to immutable type, variable's reference is changed and the previous value is left unchanged.

SECTION - A

Multiple Choice Question

26. (b) print(a, end=" ",b)
27. (b) boolean
28. (a) 40
29. (c) %
30. (c) Keywords

31. (c) \n
32. (d) Roman
33. (d) print( )
34. (c) Guido van Rossum
35. (b) yes
36. (c) Set
37. (a) Python code is both compiled and interpreted
38. (a) 7
39. (b) 4.0
40. (a) 4
41. (b) #
42. (b) 4.0
43. (a) Operands
44. (c) and
45. (d) 64
46. (c) 10

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