

**HS/XI/A.Sc.Com./CS/23**

**2023**

**COMPUTER SCIENCE**

**( Theory )**

*Full Marks : 70*

*Time : 3 hours*

*The figures in the margin indicate full marks for the questions*

*General Instructions :*

(i) Write all the answers in the Answer Script.

(ii) Attempt all the questions.

**1.** Choose the correct answer from the following  $1 \times 6 = 6$

(i) Operating system is an example of

(a) Application software

(b) Utility program

(c) System software

(d) None of the these.

(ii) ASCII is a 7 bit code for \_\_\_\_\_

(a) letters

(b) numbers

(c) other symbols

(d) All of these.

(iii) You don't have to pay for Python and you can view its source code too. It means Python is \_\_\_\_\_

(a) Free and open source

(b) Freeware

(c) Open source

(d) Shareware.

(iv) An empty/null statement in Python is \_\_\_\_\_

(a) go

(b) pass

(c) over

(d) ;

(v) What will be the output of the following code?

```
tp1 = (2, 4, 3)
```

```
tp2 = tp1 * 2
```

```
print (tp2)
```

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(a) (4, 8, 6)

(b) (2, 4, 3, 2, 4, 3)

(c) (2, 2, 4, 4, 3, 3,)

(d) Error

(vi) Using someone else's twitter handle to post something will be termed as :

(a) Fraud

(b) Identity theft

(c) Online stealing

(d) Violation

2. Answer the following in two or more sentences:  $1 \times 6 = 6$

(i) Is Python case sensitive? What is meant by the term case-sensitive?

(ii) Which function converts the value to string?

(iii) What is atom in context of expression?

(iv) What is the used of pop ( ) method in a list?

(v) What do you mean by associativity on operators?

(vi) What is a threat in computer?

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3. Answer the following questions (*any three*) :  $2 \times 3 = 6$

(i) What is the need for secondary memory?

(ii) Convert any two of the following:

(a)  $(106)_{10} = (?)_2$

(b)  $(10010)_2 = (?)_8$

(c)  $(\text{Face})_{16} = (?)_2$

(iii) Prove that  $x.(x+y) = x$  by truth table method.

(iv) Design a logic circuit for Boolean expression:

$$A + BC + \overline{D}$$

4. Answer the following questions (*any six*) :  $2 \times 6 = 12$

(i) Write an algorithm/flowchart/program to find area and perimeter of a rectangle.

(ii) What is the purpose of range ( ) function? Give one example.

(iii) What are complex numbers? How would Python represent complex number with real part as 3 and imaginary part as -25?

(iv) Given a string S, write expressions to print

(i) First five characters of S

(ii) Reversed S

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- (v) What is a statement? What is the significance of an empty statement?
- (vi) What are the different ways of creating empty dictionary?
- (vii) Differentiate between append ( ) and extend ( ) in context to list.
- (viii) How are tuples different from lists when both are sequences?

5. Answer the following questions (*any five*):  $2 \times 5 = 10$

- (i) What is digital footprints? What are the different forms of digital footprints?
- (ii) What are the damages that can caused by Adware?
- (iii) What do you understand by plagiarism?
- (iv) What are the key benefits of e-waste Recycling?
- (v) What security measures can you take up to prevent from Eavesdropping?
- (vi) Define the following terms:
  - (a) OSS
  - (b) FOSS
- (vii) Differentiate between freeware and free software.

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6. (i) State DeMorgan's theorem. 1
- (ii) Find the complement of expression: 2

$$A\bar{B} + B\bar{C}\bar{D}$$

Or

What are the major functional components of a computer system? 3

7. Answer the following questions (*any four*):  $3 \times 4 = 12$

- (i) Write a python program to calculate simple interest  $\left[ SI = \frac{P * R * T}{100} \right]$ .
- (ii) What are Relational operators? How many relational operators are available in Python? Explain with examples.
- (iii) Differentiate between split ( ) and partition ( ) in a string.
- (iv) Write a program to find the largest/ smallest number in a list/tuple.
- (v) What is debugging? Why are logical errors harder to locate?
- (vi) Write a python program to calculate factorial of a given number.

8. Why should intellectual property rights be protected? 3

*Or*

Give examples of software, hardware that may be used for special needs students. 3

9. Answer any *three* from the following:  $4 \times 3 = 12$

(i) Write a program that input a number and test if it is a prime number.

(ii) What are nested tuples? How can we access individual elements of inner tuple? Explain with examples.

(iii) How will you delete an element from a Dictionary? Explain with example.

(iv) Differentiate between break and continue statements using examples.

(v) Evaluate the following Python expressions:

a, b, c = 10, 5, 3.0

(a)  $a + b^{**}2 - a\%c$

(b)  $(b < a)$  and  $(a < b)$  or  $(c < a)$  and not  $b < a$

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