

COMPUTER SCIENCE (083)

CBSE Class XI | Vacation Assignment | Set 1

Time Allowed: 3 Hours	Maximum Marks: 70
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General Instructions

1. Answer all questions. Write Python code with proper indentation.
2. Assume Python 3.x. Unless stated otherwise, input values are valid.
3. For programming questions, include comments where helpful and show sample output when asked.

Section A — Objective / Very Short Answer (16 marks)

Q1–Q8. Choose the correct answer. ($8 \times 1 = 8$)

1. Which is a valid Python identifier? (a) 2marks (b) total_marks (c) class (d) total-marks
2. The data type of $7 / 2$ in Python 3 is: (a) int (b) float (c) str (d) bool
3. Which operator calculates remainder? (a) // (b) % (c) ** (d) /
4. A Boolean value can be: (a) True or False (b) 0 to 9 only (c) any string (d) any list
5. Which function reads input from the keyboard? (a) print() (b) type() (c) input() (d) int()
6. Which data structure is mutable? (a) tuple (b) string (c) list (d) integer
7. What does `len('CBSE')` return? (a) 3 (b) 4 (c) 5 (d) error
8. Which statement correctly starts a conditional block? (a) if $x > 5$: (b) if ($x > 5$) then (c) when $x > 5$ (d) if $x > 5$ do

Q9–Q12. Answer briefly. ($4 \times 2 = 8$)

9. Differentiate between compiler and interpreter.
10. What is the difference between RAM and secondary storage?
11. Define an algorithm and a flowchart.
12. Explain type conversion with one example.

Section B — Short Answer (18 marks)

Q13. Evaluate the following and state the output: `print(17 // 5, 17 % 5, 2 ** 4)`. (3)

Q14. Write Python statements to input a student's name and three marks, then display the name and average marks. (3)

Q15. Explain any three characteristics of a good algorithm. (3)

Q16. Write a program to check whether an integer is positive, negative or zero. (3)

Q17. Differentiate between a list and a tuple. Give one example of each. (3)

Q18. Explain primary key and foreign key in a relational database, with a simple example. (3)

Section C — Programming / Long Answer (24 marks)

Q19. Write an algorithm and Python program to calculate the area and circumference of a circle from its radius. (4)

Q20. Write a program that accepts an integer n and prints the first n natural numbers and their sum using a loop. (4)

Q21. Write a program to find the largest of three numbers without using the built-in `max()` function. (4)

Q22. Given the list `marks = [78, 65, 91, 84, 72]`, write statements to: (a) display the highest mark, (b) sort the list ascending, (c) append 88, and (d) count marks greater than or equal to 80. (4)

Q23. Explain the stages of the problem-solving cycle: understanding the problem, designing a solution, coding, testing and documentation. (4)

Q24. Write a program that counts vowels in a user-entered string. Treat uppercase and lowercase vowels equally. (4)

Section D — Application / Case-based (12 marks)

Q25. A school wants to store each student's admission number, name and class section. (a) Suggest suitable data types for each field. (2) (b) Identify a suitable primary key and explain why it should be unique. (2)

Q26. Trace the code and write the output: `total = 0\nfor i in range(1, 5):\n total += i\nprint(total)` (2) Explain the role of `range(1, 5)`. (2)

Q27. A shop calculates a discount of 10% for bills above ₹2,000 and 5% otherwise. Write a Python program that inputs the bill amount and displays the discount and final amount. (4)