

[1 Mark]

Q6. If $A = \begin{bmatrix} 2 & 0 \\ 0 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$, then the product AB equals:

* PYQ -- CBSE Board 2022

(a) $\begin{bmatrix} 2 & 4 \\ 6 & 8 \end{bmatrix}$

(b) $\begin{bmatrix} 2 & 4 \\ 3 & 4 \end{bmatrix}$

(c) $\begin{bmatrix} 1 & 4 \\ 6 & 8 \end{bmatrix}$

(d) $\begin{bmatrix} 4 & 0 \\ 0 & 8 \end{bmatrix}$

[1 Mark]

Assertion-Reason Questions (Q7 and Q8)

(a) Both Assertion (A) and Reason (R) are true, and (R) is the correct explanation of (A). (b) Both Assertion (A) and Reason (R) are true, but (R) is NOT the correct explanation of (A). (c) Assertion (A) is true but Reason (R) is false. (d) Assertion (A) is false but Reason (R) is true.

Q7. Assertion (A): The function $f : \mathbb{N} \rightarrow \mathbb{N}$ defined by $f(n) = 2n$ is one-one but not onto.

Reason (R): A function $f : X \rightarrow Y$ is onto if every element of the codomain Y has at least one pre-image in X .

[1 Mark]

Q8. Assertion (A): $\sin^{-1}(\sin 2\pi/3) = 2\pi/3$.

Reason (R): $\sin^{-1}(\sin x) = x$ for all x in $[-\pi/2, \pi/2]$.

* PYQ -- CBSE Board 2023

[1 Mark]

SECTION B -- Very Short Answer (VSA)

Each question carries 2 marks. Show necessary steps.

Q9. Find the value of: $\cos^{-1}(1/2) + 2 \sin^{-1}(1/2)$.

* PYQ -- CBSE Board 2018

[2 Marks]

Q10. If the matrix $\begin{bmatrix} x+3 & 2y-8 \\ z+1 & 4 \end{bmatrix} = \begin{bmatrix} 5 & 2 \\ 6 & 4 \end{bmatrix}$, find the values of x , y and z .

[2 Marks]

Q11. Let $A = \{1, 2, 3\}$ and $R = \{(1,1), (2,2), (3,3), (1,2), (2,1)\}$. Show that R is reflexive and symmetric but not transitive.

[2 Marks]

SECTION C -- Short Answer (SA)

Each question carries 3 marks.

Q12. Prove that: $2 \tan^{-1}(1/2) + \tan^{-1}(1/7) = \pi/4$.

* PYQ -- CBSE Board 2019 and 2020

[3 Marks]

Q13. If $A = \begin{bmatrix} 1 & 2 \\ 2 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 1 \\ 1 & 2 \end{bmatrix}$, verify that $(AB)^T = B^T A^T$.

[3 Marks]

Q14. Solve for x : $\tan^{-1}((x-1)/(x-2)) + \tan^{-1}((x+1)/(x+2)) = \pi/4$.

* PYQ -- CBSE Board 2016

[3 Marks]

SECTION D -- Long Answer (LA)

The question carries 5 marks. Internal choice is provided.

Q15. Let $f : \mathbb{N} \rightarrow \mathbb{N}$ be a function defined by $f(n) = 4n^2 + 12n + 15$. Show that $f : \mathbb{N} \rightarrow S$ is bijective, where S is the range of f .

* PYQ -- CBSE Board 2021

OR

Express the matrix $A = \begin{bmatrix} 2 & -2 & -4 \\ -1 & 3 & 4 \\ 1 & -2 & -3 \end{bmatrix}$ as the sum of a **symmetric** matrix and a **skew-symmetric** matrix.

SECTION E -- Case-Based Questions

Each question carries 6 marks (three sub-parts of 2 marks each). Read carefully before answering.

Q16. CASE STUDY -- Relations and Functions

A school organises its 6 students for a Science Exhibition project. The students are represented by the set $A = \{1, 2, 3, 4, 5, 6\}$. The class teacher defines a relation R on A as:

$R = \{(a, b) : a \text{ and } b \text{ belong to the same group}\}$, where the two groups are $G_1 = \{1, 2, 3\}$ and $G_2 = \{4, 5, 6\}$.

A second teacher defines a function $f : A \rightarrow B$, where $B = \{P, Q\}$, such that $f(1) = f(2) = f(3) = P$ and $f(4) = f(5) = f(6) = Q$.

Based on the above information, answer the following sub-parts:

(i) Verify that the relation R is an equivalence relation on A . (Check reflexivity, symmetry and transitivity.)

[2 Marks]

(ii) Write all elements of the equivalence class $[1]_R$. Hence, state the number of distinct equivalence classes that R partitions A into.

[2 Marks]

(iii) Determine whether the function f is one-one, onto, or bijective. Give one example to justify each conclusion.

[2 Marks]

Q17. CASE STUDY -- Matrices

* PYQ (Adapted) -- CBSE Board 2023

A cooperative society of farmers has a small farm. They grow two crops -- **Wheat** and **Rice**. Two farmers, Raju and Gopal, allocate their 2.4 hectares of land between the two crops as shown below:

Farmer	Wheat (hectares)	Rice (hectares)
Raju	1.0	1.4
Gopal	0.8	1.6

The profit per hectare is: Wheat = Rs. 40,000 and Rice = Rs. 30,000. Let matrix A (order 2×2) represent the area allocation and matrix P (order 2×1) represent the profit per hectare.

Based on the above data, answer the following sub-parts:

(i) Write down matrices A and P . Compute the product AP and state what each entry of AP represents.

[2 Marks]

(ii) Both Raju and Gopal decide to increase their wheat area by 0.2 ha each (reducing rice by 0.2 ha each). Write the updated matrix A' and compute the new profit matrix $A'P$.

[2 Marks]

(iii) If the profit per hectare of wheat rises to Rs. 50,000 while rice remains at Rs. 30,000, write the new profit matrix P' . Using original matrix A , compute AP' . By how much (in Rs.) does Raju's total profit increase compared to part (i)?

[2 Marks]

Answer Key (Section A MCQs)

Q1 --> (c)	Q2 --> (d)	Q3 --> (b)	Q4 --> (b)	Q5 --> (b)	Q6 --> (a)	Q7 --> (a)	Q8 --> (d)
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- - - End of Question Paper - - -

PM SHRI KV SEONI

Computer Science (Code 083) | Class XII | CBSE Board

Session: 2026-2027

School	PM SHRI KV SEONI
Session	2026-2027
Subject Teacher	Mrs. Prerna Bansal PGT CS
Subject & Code	Computer Science — Code 083
Chapters Covered	Ch-1: Python Revision Tour Ch-2: Working with Functions
Student Name	
Class & Section	XII — _____
Roll Number	
Submission Date	First working day after Summer Vacation

□ GENERAL INSTRUCTIONS

1. This Holiday Homework covers TWO chapters: Chapter 1 — Python Revision Tour and Chapter 2 — Working with Functions, as per the CBSE Class XII Computer Science Syllabus 2026-27 (Code 083).
2. The paper has FIVE Sections — A to E. Attempt ALL questions.
3. Section A: MCQ (10×1=10 M) | Section B: Assertion-Reasoning (10×1=10 M) | Section C: Case-Based (10×2=20 M) | Section D: Competency-Based (10×3=30 M) | Section E: Programming (10×3=30 M) | TOTAL: 100 Marks
4. ALL programming questions must be answered in Python only.
5. Write your answers neatly in your CS Holiday Homework notebook/file.
6. Questions are framed from Previous Year CBSE Board Papers (2022–2025) pattern.
7. Do NOT copy from peers. Original work will be awarded full marks.

SECTION A — Multiple Choice Questions (MCQ) [10 × 1 = 10 Marks]

Choose the correct answer. Write the option letter AND the text of your answer.

Q1. Which of the following is an IMMUTABLE data type in Python?

- (a) List
- (b) Dictionary
- (c) Tuple
- (d) Set

Answer: _____

Q2. What will be the output of the following statement? `print(type(10/2))`

- (a) `<class 'int'>`
- (b) `<class 'float'>`
- (c) `<class 'str'>`
- (d) Error

Answer: _____

Q3. Which keyword is used to define a function in Python?

- (a) `func`
- (b) `define`

- (c) def
- (d) function

Answer: _____

- Q4.** Identify the OUTPUT of the following: `S = "MISSISSIPPI" print(S[:4] + "#" + S[-5:])`
- (a) MISS#SIPPI
 - (b) MISS#IPPI
 - (c) MISS#ISSI
 - (d) MISI#SIPPI

Answer: _____

- Q5.** A variable defined inside a function and NOT accessible outside it is called a:
- (a) Global variable
 - (b) Default variable
 - (c) Local variable
 - (d) Static variable

Answer: _____

- Q6.** Which of the following function calls uses KEYWORD arguments?
- (a) `area(5, 10)`
 - (b) `area(l=5, b=10)`
 - (c) `area(5)`
 - (d) `area()`

Answer: _____

- Q7.** What is the output? `def fun(x, y=10): return x + y print(fun(5))`
- (a) 5
 - (b) 10
 - (c) 15
 - (d) Error

Answer: _____

- Q8.** Which of the following correctly identifies a SYNTAX ERROR?
- (a) `5 + 3.0`
 - (b) `'15' + 3`
 - (c) `print 'Hello'`
 - (d) `x = True + 1`

Answer: _____

- Q9.** What will be the output? `L = [10, 20, 30, 40] print(L[1:3])`
- (a) `[10, 20]`
 - (b) `[20, 30]`
 - (c) `[20, 30, 40]`
 - (d) `[10, 20, 30]`

Answer: _____

- Q10.** The `global` keyword inside a function is used to:
- (a) Create a new local variable
 - (b) Refer to and modify a global variable
 - (c) Delete a global variable
 - (d) Make a variable read-only

Answer: _____

SECTION B — Assertion & Reasoning Questions [10 × 1 = 10 Marks]

Direction: Read both Assertion (A) and Reason (R) carefully. Choose the correct option:

- (a) Both A and R are TRUE, and R is the correct explanation of A.
- (b) Both A and R are TRUE, but R is NOT the correct explanation of A.
- (c) A is TRUE but R is FALSE.
- (d) A is FALSE but R is TRUE.

Q1.

Assertion (A): In Python, strings are immutable.

Reason (R): You cannot change individual characters of a string using indexing (e.g., `s[0]='A'` raises a `TypeError`).

Answer: _____

Q2.

Assertion (A): Positional arguments in Python must be passed in the exact order as defined in the function signature.

Reason (R): Python functions automatically assign default values to positional arguments.

Answer: _____

Q3.

Assertion (A): A function can return multiple values in Python.

Reason (R): Python returns multiple values as a tuple when separated by commas in the return statement.

Answer: _____

Q4.

Assertion (A): The `global` keyword must be used inside a function to read a global variable.

Reason (R): Without `global`, a function can READ a global variable but cannot modify it unless `global` is declared.

Answer: _____

Q5.

Assertion (A): Python lists and tuples both support indexing and slicing.

Reason (R): Both lists and tuples are sequence types in Python; the key difference is mutability.

Answer: _____

Q6.

Assertion (A): A function without an explicit `return` statement returns `None` by default.

Reason (R): The `return` statement is mandatory in every Python function.

Answer: _____

Q7.

Assertion (A): Default parameters in a function definition must always appear AFTER positional (non-default) parameters.

Reason (R): If default parameters appear before positional ones, Python raises a `SyntaxError` due to ambiguity in argument mapping.

Answer: _____

Q8.

Assertion (A): The `len()` function can be used on strings, lists, tuples, and dictionaries.

Reason (R): All four are sequence or collection types that store multiple elements and support `len()`.

Answer: _____

Q9.

Assertion (A): Logical errors in Python are detected by the interpreter at runtime.

Reason (R): Logical errors produce incorrect output but do not crash the program; they must be found through testing and debugging.

Answer: _____

Q10.

Assertion (A): In Python, a variable defined inside an `if` block is accessible outside that block in the same function.

Reason (R): Python uses function scope (not block scope), so variables defined inside `if`, `for`, or `while` blocks are accessible throughout the function.

Answer: _____

SECTION C — Case-Based Questions [10 × 2 = 20 Marks]

Read each case carefully and answer the questions that follow:

CASE 1: The Library Management Program

Ananya is building a library management system in Python. She writes the following code:

```
books = ['Python Basics', 'Data Science', 'AI Foundations', 'Web Dev']
def search_book(title, lib=books):
    if title in lib:
        return 'Book Found: ' + title
    else:
        return 'Not Available'

result = search_book('AI Foundations')
print(result)
print(search_book('Cloud Computing'))
```

QC1.1. What type of argument is `lib=books` in the function definition? What is it called, and what is its purpose? (2 marks)

QC1.2. Write the output produced by this program when it is executed. (2 marks)

CASE 2: Score Calculator

Rahul's teacher gave him the following Python code and asked him to find the output and spot the scope of variables:

```
score = 100

def update(marks):
    global score
    score = score + marks
    bonus = 10
    print('Inside function:', score, bonus)

update(25)
print('Outside function:', score)
# print(bonus) <- if uncommented, what happens?
```

QC2.1. Write the exact output produced by the above code. (2 marks)

QC2.2. What will happen if the commented ``print(bonus)`` line is uncommented and executed? Name the type of error that will occur and explain why. (2 marks)

CASE 3: String Operations — Palindrome Checker

Observe the following Python code written by Meera for a string-based task:

```
S = "Racecar Car Radar"
L = S.split()
for W in L:
    x = W.upper()
    if x == x[::-1]:
        for I in x: print(I, end="*")
    else:
        for I in W: print(I, end="#")
    print()
```

QC3.1. Write the complete output of the above code step by step. (2 marks)

QC3.2. What does ``x[::-1]`` do? What concept from Python Revision Tour does this belong to? (2 marks)

CASE 4: Mutable vs Immutable in Functions

Vikram passes a list and a number to two different functions and observes the results:

```
def modify_list(lst):
```

```
lst.append(99)
print('Inside:', lst)

def modify_num(n):
    n = n + 10
    print('Inside:', n)

my_list = [1, 2, 3]
my_num = 5
modify_list(my_list)
modify_num(my_num)
print('Outside list:', my_list)
print('Outside num:', my_num)
```

QC4.1. Write the complete output of this code. (2 marks)

QC4.2. Why does `my_list` change outside the function but `my_num` does not? Explain using the concept of mutable and immutable types. (2 marks)

CASE 5: Dictionary Operations

Ritu writes the following code during a Python revision exercise:

```
D = {'month': 'DECEMBER', 'exam': 'PREBOARD1'}
D['month'] = 'JANUARY'
D['EXAM'] = 'PRE2'
print(D.items())
print(len(D))
for k in D:
    print(k, '->', D[k])
```

QC5.1. Write the complete output of this code. (2 marks)

QC5.2. Why does the dictionary have 3 keys instead of 2 after the update? Relate this to how Python dictionary keys work. (2 marks)

SECTION D — Competency-Based Questions [10 × 3 = 30 Marks]

Answer in 3-5 sentences. Use examples wherever relevant. Apply and Analyse level questions (HOTS).

QD1. Differentiate between MUTABLE and IMMUTABLE data types in Python. Give TWO examples of each. Why does this distinction matter when passing arguments to functions? (3 marks)

QD2. Explain the FOUR types of function arguments in Python with syntax and one example each: Positional, Default, Keyword, and Variable-length. (3 marks)

QD3. What is LOCAL scope and GLOBAL scope in Python? Explain the LEGB rule (Local–Enclosing–Global–Built-in) with a suitable example. (3 marks)

QD4. Distinguish between the following Python string methods with examples: (i) find() vs index() (ii) split() vs join() (iii) strip() vs replace() (3 marks)

QD5. Rohan writes a function that is supposed to return BOTH the sum AND the product of two numbers but it only seems to return one value. Explain how Python supports returning multiple values from a function. Write a correct version of such a function. (3 marks)

QD6. Compare LIST, TUPLE, and DICTIONARY in Python under: (i) Mutability (ii) Ordering (iii) Syntax (iv) Use case. Present as a table or structured comparison. (3 marks)

QD7. Explain what happens step-by-step when Python executes: `V=50 ; def Change(N): global V ; V,N=N,V ; print(V,N,sep='#',end='@') ; Change(20) ; print(V)` — trace the output and explain global variable behavior. (3 marks)

QD8. What is IMPLICIT TYPE CONVERSION in Python? How does it differ from EXPLICIT TYPE CONVERSION (typecasting)? Give TWO examples of each. (3 marks)

QD9. Neha wrote a function `def calc(a, b=5, *args)` and called it as `calc(1, 2, 3, 4)`. Predict what `a`, `b`, and `args` will contain during this call. Explain the role of `*args` in Python functions. (3 marks)

QD10. Describe any THREE common types of Python errors (Syntax, Runtime, Logical) with one original example of each. Explain how you would detect and fix each type. (3 marks)

SECTION E — Programming Questions [10 × 3 = 30 Marks]

This section has 4 sub-types: (i) Output Finding (ii) Error Finding & Correction (iii) Function Writing (iv) Mini Programs. All answers must be in Python.

PART E-I — Find the Output (Questions P1 to P4)

QP1. Write the output of the following Python code: (3 marks)

```
def mystery(s):
    result = ''
    for i in range(len(s)-1, -1, -2):
        result += s[i]
    return result

print(mystery("KEYBOARD"))
print(mystery("PYTHON"))
```

Output:

QP2. Find all possible outputs of the following code. Also state the minimum and maximum values of `b`: (3 marks)

```
import random
a = "Wisdom"
b = random.randint(1, 6)
for i in range(0, b, 2):
    print(a[i], end="#")
```

Possible Outputs / Min-Max of b:

QP3. Write the output of this code step by step: (3 marks)

```
T = (9, 18, 27, 36, 45, 54)
L = list(T)
L1 = []
for i in L:
    if i % 6 == 0:
        L1.append(i)
```

```
T1 = tuple(L1)
print(T1)

D = {1:'one', 2:'two', 3:'three'}
res = []
for k, v in D.items():
    if 'o' in v:
        res.append(k)
print(res)
```

Output:

QP4. Trace and write the output of this function-based code: (3 marks)

```
c = 10
def add():
    global c
    c = c + 2
    print(c, end='#')

add()
c = 15
print(c, end='%')
```

```
def FunStr(S):
    T = ''
    for i in S:
        if i.isdigit():
            T = T + i
    return T

X = "PYTHON 3.9"
Y = FunStr(X)
print(X, Y, sep="*")
```

Output:

PART E-II — Error Finding & Correction (Questions P5 & P6)

QP5. The following code has SYNTAX and LOGICAL errors. Rewrite the corrected code. Underline ALL corrections made: (3 marks)

```
def swap_first_last(tup)
    if len(tup) < 2:
        return tup
    new_tup = (tup[-1],) + tup[1:-1] + (tup[0])
    return new_tup

result = swap_first_last((1, 2, 3, 4))
print("Swapped tuple: " result)
```

Errors found and corrected code:

QP6. Identify the errors in this function, state the type of each error, and write the corrected version: (3 marks)

```
def calculate_average(numbers)
    total = 0
    for num in numbers:
        total = total + num
    avg = total / len(numbers)
    print average
    return avg

marks = [85, 90, 78, 92, 88]
result = calculate_average(marks)
print("Average:", Result)
```

Errors and corrected code:

PART E-III — Write the Functions (Questions P7 to P10)

PM SHRI KENDRIYA VIDYALAYA SEONI
HOLIDAY HOMEWORK
SUMMER VACATION
CLASS - XII A
CAREER GUIDANCE

Class 12 Mathematics Stream – Holiday Homework

Theme: Innovation, Technology & Problem Solving Careers

Tasks:

Research ANY THREE careers such as: AI Engineer, Data Scientist, Software Developer, Architect, Pilot, Statistician, Robotics Engineer, Cybersecurity Analyst, Actuary, Game Designer.

Include:

- Qualifications
- Entrance exams
- Skills required
- Salary
- Future demand
- AI impact on the profession

Create a project on **ONE** topic:

- Maths in Stock Market
- Maths in Architecture
- Maths in Cricket Statistics
- Maths in Gaming
- Maths in Space Science

Reflection Writing: "How do my personality and skills match my future career?"

Interview a professional working in Engineering/IT/Architecture/Aviation and note key learnings.

Instructions:

- Submit in a neat file/folder.
- Use charts, pictures, diagrams, or Canva designs if possible.
- Creativity and originality will be appreciated.

Submission Date: 17/06/2026

PM SHRI KENDRIYA VIDYALAYA SEONI
HOLIDAY HOMEWORK
SUMMER VACATION
CLASS - XII
CAREER GUIDANCE

Class 12 Biology Stream – Holiday Homework

Theme: Careers in Healthcare & Life Sciences

Tasks to Complete:

1. Research **ANY THREE** careers from:

Doctor, Clinical Psychologist, Nutritionist, Physiotherapist, Biotechnologist, Genetic Counselor, Microbiologist, Wildlife Biologist, Public Health Professional, Forensic Scientist.

For each career include:

- Qualifications required
- Entrance exams
- Skills needed
- Salary range
- Future scope
- Work-life balance

2. Make a comparison chart between **ANY TWO** careers/courses such as:

- MBBS vs Psychology
- Biotechnology vs Microbiology
- Nutrition vs Physiotherapy

Compare:

- Duration
- Fees
- Job opportunities
- Salary
- Growth opportunities

3. Reflection Writing (400–500 words):

“If I worked in a healthcare profession, how would I help society?”

4. Learn **ONE** healthcare-related practical skill:

- First Aid
- Mindfulness
- Healthy Diet Planning
- Yoga for Stress Relief
- Mental Health Awareness

Write what you learned and why it is important.

Instructions:

- Submit in a neat file/folder.
- Use charts, pictures, diagrams, or Canva designs if possible.
- Creativity and originality will be appreciated.

Submission Date: **17/06/2026**

This hand-written English Summer Holiday Homework for Class 12th from PM Shri Kendriya Vidyalaya Seoni consists of seven tasks.

Here is a breakdown of the requirements:

Homework Tasks

1. **Reading Comprehension:** Solve **two passages** (provide answers only).
2. **Case-Based Analysis:** Solve **two case-based passages** (provide answers only).
3. **Writing Skills (Notice):** Draft **one notice** (provide answer only).
4. **Article Writing:** Write an article on **"Global Warming"** (Word count: 120 –150 words).

3. **Writing Skills (Notice):** Draft **one notice** (provide answer only).
4. **Article Writing:** Write an article on "**Global Warming**" (Word count: 120 –150 words).
5. **Vocabulary:** Write down the **word meanings** for the chapters in your textbooks, *Flamingo* and *Vistas*.
6. **Literary Review:** Complete **one book review** (Word count: approx. 200 words).
7. **Grammar Review:** Study and read the rules for the following topics:
 1. Tenses
 2. Determiners
 3. Subject-Verb Agreement
 4. Modals
 5. Prepositions and Conjunctions