

ALAKSHYA PUBLIC SCHOOL
HALF YEARLY EXAMINATION (2026–27)
CLASS XII
SUBJECT: COMPUTER SCIENCE (083)

SET-A

Time Allowed: 3 Hours

Maximum Marks: 70

General Instructions

1. This question paper contains **37 questions** divided into **5 Sections – A, B, C, D, and E.**
2. All questions are compulsory. However, internal choices have been provided in some questions. Attempt only one choice in such questions.
3. **Section A** consists of **21 questions (1 to 21).** Each question carries **1 mark.**
4. **Section B** consists of **7 questions (22 to 28).** Each question carries **2 marks.**
5. **Section C** consists of **3 questions (29 to 31).** Each question carries **3 marks.**
6. **Section D** consists of **4 questions (32 to 35).** Each question carries **4 marks.**
7. **Section E** consists of **2 questions (36 and 37).** Each question carries **5 marks.**
8. All programming questions must be answered using **Python Language** only.

SECTION A (21 Marks)

1. Which of the following is a keyword in Python?

- (A) Break (B) None (C) For (D) Class

2. What will be the output of the following statement?

```
print(18 / 3 == 18 // 3)
```

- (A) 0 (B) False (C) 1 (D) True

3. Consider the statements given below and choose the correct output:

```
D = {"A": "MUMBAI", "B": "CHENNAI"}  
print("C" in D)
```

- (A) False (B) 0 (C) True (D) 1

4. What will be the output of the following Python code segment?

```
try:  
    num = 5  
    text = "15"  
    result = str(num) + text  
    print(result)  
except:  
    print("Error")
```

- (A) Error (B) 515 (C) 20 (D) 75

5. What will be the output of the following statement?

```
print("X" * 2, "Y", end=2 * "X", sep="#")
```

- (A) Error (B) YY#XX (C) XXYY# (D) XX#YXX

6. If L is an empty list, which of the following expressions is invalid?

- (A) L + 'Hello' (B) L + [] (C) L + [2] (D) L * 2

7. Which of the following statements will return the substring "STR" (i.e., the first 3 characters) from the string "STRING"?

- (A) "STRING"[: -3] (B) "STRING"[-3::-1]
- (C) "STRING"[3:] (D) "STRING".startswith(3)

8. Consider the statements given below and choose the correct output:

```
K = ('A', 'B')
V = 'TEST'
D = dict.fromkeys(K, V)
print(D)
```

- (A) {'A': 'TEST', 'B': None} (B) {'A': None, 'B': 'TEST'}
- (C) {'A': 'TEST', 'B': 'TEST'} (D) Error

9. Which of the following is true about `clear()` in Python dictionaries?

- (A) It deletes the dictionary itself along with all its elements.
- (B) It deletes all items of the dictionary resulting in an empty dictionary.
- (C) If `D` is a dictionary, then `clear(D)` is the correct syntax.
- (D) No such function/method exists in Python.

10. Which of the following list methods accepts **exactly 2 parameters**?

- (A) append() (B) extend() (C) insert() (D) pop()

11. Which of the following options is the correct mode to open an existing binary pickled file to append data to it?

- (A) 'rb' (B) 'ab' (C) 'w' (D) 'r'

12. What will be the output of the following code segment?

```
a = 5
def func_1(b=10):
    global a
    a = b - 10
    b += a
    print(a, b)

func_1(a)
```

- (A) $\begin{pmatrix} 0 & 5 \\ 5 & 0 \end{pmatrix}$ (B) $\begin{pmatrix} 5 & 0 \\ 0 & 5 \end{pmatrix}$ (C) $\begin{pmatrix} 0 & -5 \\ 5 & 0 \end{pmatrix}$ (D) $\begin{pmatrix} -5 & 0 \\ 0 & 5 \end{pmatrix}$

13. What is the output of the following math expression in Python?

```
import math
print(math.ceil(3.2) + math.floor(3.8))
```

- (A) 6 (B) 7 (C) 6.0 (D) 7.0

14. Which method in Python file handling returns the current byte position of the file pointer within a file?

(A) seek() (B) tell() (C) read() (D) offset()

15. State whether the following statement is True or False: If T is a tuple and L is a list, then $T + L$ is a valid statement in Python.

16. A text file `song.txt` contains: "Life goes on as it never ends". What will be the output of the following code?

```
f1 = open("song.txt", "r")
s1 = f1.read(5)
s2 = f1.readline(4)
s3 = f1.read(3)
print(s1, s3, sep="#")
```

(A) goes# on (B) Life #goes# on (C) Life # on (D) Error

17. Which of the following is a mapped data type in Python?

(A) List (B) Tuple (C) Dictionary (D) String

18. In a Stack data structure, if elements 'A', 'B', and 'C' are pushed in order, which element will be removed first during a `pop` operation?

(A) 'A' (B) 'B' (C) 'C' (D) None

19. What is the output of the following string operation?

```
Sports = "Paralympic Games"
print(Sports.split("m"))
```

(A) ['Paraly', 'm', 'pic Ga', 'm', 'es'] (B) ('Paraly', 'm', 'pic Games')
(C) ('Paraly', 'pic Ga', 'es') (D) ['Paraly', 'pic Ga', 'es']

Questions 20 and 21 are Assertion (A) and Reason (R) based questions. 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.

20. Assertion (A): Every object in Python is assigned a unique identity (ID).

Reason (R): The identity (ID) remains the same for the lifetime of that object.

21. Assertion (A): The `upper()` method in Python returns the string with all lowercase characters converted to uppercase.

Reason (R): Strings are mutable objects in Python.

SECTION B (14 Marks)

22. Differentiate between `=` and `==` operators in Python. Give a supporting example of each.

23. What are default parameters in Python functions? Explain with the help of a code example.

24. Answer either part (I) or part (II):

(I) Consider the tuple: `PRICE = (100, 55, 72, 65, 85, 90)`

- (a) Write a single-line Python statement to display the elements of `PRICE` in ascending order.

OR

- (b) Write a single-line Python statement to calculate and display the average price of all values in `PRICE`.

(II) Answer either part (a) or part (b):

- (a) Write a single-line Python statement using built-in methods to display string `s = "time is precious"` with every occurrence of character `'i'` replaced by `'_'`.

OR

- (b) Write a Python statement to delete the first occurrence of element `25` from list `myList`.

25. What possible output(s) from the given options can be generated when the following code is executed? Justify your answer and state the minimum and maximum possible values of variable `b`.

```
import random
s = "War and Peace"
a = len(s) // 2
for i in range(4):
    b = random.randrange(i, a)
    print(s[b], end='+')
```

(A) `n+P+d+a+` (B) `W+r+n+n+` (C) `e+r+W+a+` (D) `a+P+e+r+`

26. The code given below is intended to input a positive integer from the user and display the total number of its factors. However, there are syntax and logical errors. **Rewrite** the code after removing all errors and underline all corrections made.

```
n = int(input("Enter a positive integer:"))
c = 0
for i in range(n + 1):
    if n % i == 0:
        c += 1
print(c)
```

27. Briefly explain the difference between a **Syntax Error** and a **Runtime Error** in Python. Provide one code example for each.

28. Answer either part (I) or part (II):

(I) Write two main differences between a **Text File** and a **Binary File**.

OR

(II) Differentiate between an **Absolute Path** and a **Relative Path** of a file with an example for each.

SECTION C (9 Marks)

29. Answer either part (a) or part (b):

(a) Write a user-defined function `Find_Pattern()` in Python that reads the contents of a text file named "LOGS.TXT" and displays all lines that begin with the word "ERROR" (case-sensitive).

Example file content:

```
INFO: System startup complete.
WARNING: Disk space low on drive C:.
ERROR: Failed to connect to database.
INFO: User 'admin' logged in.
ERROR: Invalid input received from client.
```

Expected Output:

```
ERROR: Failed to connect to database.
ERROR: Invalid input received from client.
```

OR

(b) Write a user-defined function `display_dot_lines()` in Python that displays all lines ending with a dot (.) from a text file "Colors.txt". (Hint: Strip trailing whitespaces before checking).

30. Answer either part (a) or part (b):

(a) A stack named `KeyStack` contains records of computer keyboards represented as lists containing [Make, Keys, Connectivity], e.g., ['Hitech', 105, 'USB']. Write the following user-defined functions in Python:

- (I) `push_key(KeyStack, new_key)`: To push a new record `new_key` onto `KeyStack`.
- (II) `pop_key(KeyStack)`: To pop the topmost record from `KeyStack` and return it. If empty, display "Underflow".
- (III) `isEmpty(KeyStack)`: Returns `True` if `KeyStack` is empty, otherwise returns `False`.

OR

(b) Consider a globally declared dictionary `EMPLOYEE_PERFORMANCE = {"E101": 85, "E102": 92, "E103": 78, "E104": 95}`. Write user-defined functions to manage a stack `TOP_PERFORMERS_LIST`:

- (I) `PushHighPerformers()`: Pushes employee IDs with performance scores > 90 onto `TOP_PERFORMERS_LIST`.
- (II) `IsPerformanceListEmpty()`: Returns `True` if stack is empty, else `False`.
- (III) `PopPerformer()`: Pops and returns the top employee ID. If empty, displays "Stack Underflow".

31. Answer either part (a) or part (b):

(a) Predict the output upon execution of the following Python code:

```
def ALTER(Y=25):
    global X
    Y += X
    X += Y
    print(X, Y, sep="#")
```

```
X = 5
Y = 15
ALTER(Y)
ALTER()
print(X, Y, sep="@")
```

OR

(b) Predict the output upon execution of the following Python code:

```
def Transform(D_A, D_B):
    D_C = {}
    D_C.update(D_A)
    D_A.update(D_B)
    D_B.update(D_C)
    return D_C

Init_Stock = {"Chocolate": 100, "Cookie": 50}
New_Arriv = {"Cookie": 60, "Chocolate": 120}
T_Data = Transform(Init_Stock, New_Arriv)
print(Init_Stock)
print(New_Arriv)
print(T_Data)
```

SECTION D (16 Marks)

32. Write user-defined functions in Python to perform operations on a binary file "STUDENT.DAT" storing records in list format [RollNo, Name, Marks]:

- `AddStudent()`: Accepts student details from the user and appends the record to "STUDENT.DAT" using the `pickle` module.
- `SearchStudent(rno)`: Searches for a student by RollNo in "STUDENT.DAT". Displays the record if found, or prints "Record Not Found".

33. Suman is tasked with managing records in a CSV file named "CLUB.CSV" storing member details: [Mno, Name, Mobile, Fee]. Write Python code defining two user-defined functions:

- `NewMembers()`: Accepts records from the user and appends them to "CLUB.CSV" using the `csv` module.
- `PriorityMember()`: Reads "CLUB.CSV" and displays members paying a Fee greater than 35000.

34. Write a Python program with a function `CopyData()` that reads a text file "STORY.TXT" and creates a new text file "UPDATE.TXT" containing all lines from "STORY.TXT" except those that start with the letter 'A' or 'a'. Handle potential `FileNotFoundError` using a `try-except` block.

35. Answer either part (a) or part (b):

(a) Write a Python user-defined function `ProcessEmployees(EmpDict)` that takes a dictionary containing employee names as keys and their salaries as values (e.g., {"Anil": 45000, "Sunita": 62000, "Raj": 38000}). The function should:

1. Calculate and display the mean salary using the `statistics` module.
2. Filter and return a list of employee names earning above the mean salary.

OR

(b) Write a user-defined function `ListOperations(L)` that accepts a list of numbers and performs:

1. Replaces every even number with its square.
2. Replaces every odd number with double its value.
3. Prints the maximum, minimum, and sum of all modified elements using built-in list functions.

SECTION E (10 Marks)

36. Keshav is the IT Head in a hospital managing doctor records. Each record is represented as a list: [D_ID, D_Name, D_Dept, Experience], e.g., [1256, 'R. Gupta', 'Cardiology', 15].

Answer the following questions in Python:

- (I) Write one advantage of storing hospital records in a binary file over a CSV file. **[1 Mark]**
- (II) Write a function `DisplayAll()` in Python to read and display all records from the binary file "DOCTORS.DAT". **[2 Marks]**
- (III) Write a function `addDoctor()` in Python that accepts a new doctor's details from the user and appends the **list record** into "DOCTORS.DAT". **[2 Marks]**

37. A school library maintains books in a Python dictionary `LIBRARY = {101: ["Python Prog", 5], 102: ["Data Structures", 2], 103: ["Networking", 0]}` where BookID is key and [Title, Copies] is value.

Write a complete Python menu-driven script implementing Stack operations:

- (I) Define Stack data structure and state the principal rule (LIFO/FIFO) under which it operates. **[1 Mark]**
- (II) Write a function `PushAvailableBooks(BookStack)` to push BookIDs of all books having Copies > 0 onto BookStack. **[2 Marks]**
- (III) Write a function `PopBook(BookStack)` to pop and return the top BookID from BookStack. Display "Stack Underflow" if the stack is empty. **[2 Marks]**