CAMBRIAN PUBLIC SCHOOL

KANKE ROAD, RANCHI

ASSIGNMENT SET 2

Subject: Computer Science (083) **Class: XII**

Part A: Multiple Choice Questions (15 Marks)

1) Which Python operator is used for integer floor division?
   a) / b) //
   c) % d) **
2) What will be the output of bool([]), bool(0), bool("False")?
   a) False, False, False b) False, False, True
   c) True, True, False d) False, True, True
3) What is the default return value of a Python function that does not contain an explicit return statement?
   a) 0 b) False
   c) None d) Void
4) Which mode must be used to open an existing text file to add new content at the end without overwriting existing data?
   a) 'w' b) 'r+'
   c) 'a' d) 'w+'
5) What does file.tell() return?
   a) Total line count of the file b) Current byte position of the file pointer
   c) Total size of file in kilobytes d) File handle status
6) If a stack is implemented using a list stk = [], which expression checks for an Underflow condition?
   a) stk == None b) len(stk) == 0
   c) stk.top() == 0 d) stk[-1] == 0
7) In MySQL, which wildcards are used with the LIKE operator for pattern matching?
   a) * and ? b) % and _
   c) # and @ d) & and $
8) Which SQL command permanently saves changes made during a transaction?
   a) SAVEPOINT b) ROLLBACK
   c) COMMIT d) FLUSH
9) What is the output of the code snippet below?

```
Python
def display(s):
    m = ""
    for i in range(len(s)):
        if s[i].isupper():
            m += s[i].lower()
        elif s[i].islower():
```

```
            m += s[i].upper()
        else:
            m += "#"
    return m

print(display("Py3.0"))
```

a) pY#.# b) pY3.0

c) pY## d) pY###

10) Which built-in library module in Python contains random.randint(a, b)?

a) math b) sys

c) random d) numbers

11) When reading a CSV file using csv.DictReader(file), what type of objects are yielded for each row?

a) Lists b) Tuples

c) Dictionaries d) Strings

12) Which aggregate function ignores NULL values when performing computations?

a) COUNT(*) b) SUM()

c) AVG() d) Both b and c

13) What happens if a file opened in 'r' mode does not exist on disk?

a) A new empty file is created b) FileNotFoundError is raised

c) File opens with None content d) Python hangs indefinitely

14) In relational algebra / SQL, what does a PRIMARY KEY constraint ensure?

a) Values must be unique only b) Values can contain at most one NULL

c) Auto-increment feature is mandatory d) Values must be both UNIQUE and NOT NULL

15) What is the result of evaluation for stk = [10, 20, 30]; stk.pop(); stk.append(40)?

a) [10, 20, 30, 40] b) [10, 20, 40]

c) [40, 20, 30] d) [10, 40]

Part B: Short Answer Questions (10 Questions x 2 Marks = 20 Marks)

16) **[Python Revision]** Find and write the output of the following Python code:

```
Python
L = [10, 20, 30, 40, 50]
L[1:4] = [25, 35]
print(L)
```

17) **[Functions]** Write a Python function CheckPrime(num) that accepts an integer parameter num and returns True if it is a prime number, otherwise False.

18) **[Functions]** What are mutable and immutable default arguments in Python? Explain why using a mutable object (like a list) as a default parameter can cause unexpected behavior.

19) **[File Handling - Text]** Write a Python function DisplayVowels() that reads a text file STORY.TXT line by line and displays only those lines that start with a vowel (A, E, I, O, U / a, e, i, o, u).

20) **[File Handling - Binary]** Explain the difference between text files and binary files with respect to encoding, storage structure, and line-ending characters.

21) **[File Handling - CSV]** Write Python code to read a file DATA.CSV where the delimiter used between fields is a pipe character (|) instead of a comma.

22) **[Data Structure - Stack]** Write a function Peek(Stack) in Python that displays the topmost element of a stack without removing it. If the stack is empty, display an appropriate message.

23) **[SQL]** Consider table BOOK(Book_ID, Title, Author, Price, PubDate). Write SQL commands to:
   a) Display books whose title contains the word "Python".
   b) Change the price of all books published before '2020-01-01' to receive a 10% discount.

24) **[SQL Aggregate]** State the difference between COUNT(*) and COUNT(column_name) in SQL with an example.

25) **[SQL Constraints]** Define FOREIGN KEY constraint and explain how it maintains referential integrity between two tables.

Part C: Case-Based Questions (5 Questions x 4 Marks = 20 Marks)

26) **Case Study 1: Python Data Structures & Functions**

A library system uses list operations to process borrowing transactions.

```
Python
def process_queue(items):
processed = []
while items:
val = items.pop(0)
if val % 2 == 0:
processed.append(val * 2)
else:
processed.append(val + 5)
return processed

data = [12, 7, 15, 20]
res = process_queue(data[:])
```

   a) What will res contain after execution?
   b) What is the value of data after process_queue(data[:]) runs? Explain why.
   c) How would the result change if process_queue(data) (without [:]) was passed?
   d) State whether Python lists are passed to functions by value or by object reference.

27) **Case Study 2: Text File Analysis & Update**

A text file LOG.TXT stores server message logs line by line.

   a) Write a function CopyErrorLogs() that reads LOG.TXT and copies all lines containing the substring "ERROR" into a new file ERRORS.TXT.
   b) Write a function CountDigits() that reads LOG.TXT and returns the total number of numeric digits present throughout the entire file.

28) **Case Study 3: CSV File Record Operations**

A supermarket stores customer billing data in bills.csv with fields [BillNo, CustomerName, Amount, PaymentMode].

   a) Write a Python function AddBill() to take input from the user for a new bill and append it to bills.csv.

b) Write a Python function TotalUPI() that reads bills.csv and computes the total sum of Amount spent by customers who used 'UPI' as their PaymentMode.

29) **Case Study 4: Stack Implementation for Word Reversal**

A text utility uses a stack data structure to reverse words in a sentence.

a) Define a Python function PushChar(Stack, char) to push a character onto Stack.

b) Write a Python function ReverseString(sentence) that uses stack operations (PushChar and Pop) to reverse and return the given sentence string.

30) **Case Study 5: SQL Grouping, Joining & Queries**

Consider two tables STUDENT and STREAM:

Table: STUDENT

RollNo	SName	Class	StreamID
1	Aarav	12A	S101
2	Bhavna	12B	S102
3	Chirag	12A	S101
4	Divya	12C	S103

Table: STREAM

StreamID	StreamName	TeacherInCharge
S101	Science	Dr. Sharma
S102	Commerce	Prof. Gupta
S103	Humanities	Ms. Roy

Write SQL queries for the following:

a) Display RollNo, SName, and StreamName for all students using Equi-Join / Natural Join.

b) Display total count of students in each StreamID.

c) Display SName and TeacherInCharge for students in Class '12A'.

d) Add a new column Email VARCHAR(50) to table STUDENT.

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