BRAIN INTERNATIONAL SCHOOL

PRACTICE PAPER 1

Subject – Computer Science (083)

CLASS XII

==========

SECTION A (1 Mark Each)

==========

Q1. State True or False: "Identifiers are names used to identify a variable, function, or class in a Python program."

Q2. Which of the following is not a valid keyword in Python?

(a) False (b) return (c) None (d) while

Q3. Predict the output: print('py' * 2 + 'thon'[::-1])

(a) pypynoht (b) pythoyp (c) pypython (d) pyhton

Q4. Correct expansion of TCP?

(a) Transmission Control Protocol (b) Transfer Control Protocol

(c) Transport Control Program (d) Transmission Chat Protocol

Q5. Which topology requires central device failure to isolate all nodes?

(a) Bus (b) Star (c) Ring (d) Mesh

Q6. Select correct output: S="Amrit Mahotsav @ 75"; a=S.partition(" "); print(a)

(a) ('Amrit Mahotsav','@','75') (b) ['Amrit','Mahotsav','@','75']

(c) ('Amrit', 'Mahotsav @ 75') (d) ('Amrit', ' ', 'Mahotsav @ 75')

Q7. Which mode keeps the file offset position at the end of the file?

(a) r (b) w (c) a (d) r+

Q8. Find Output: import math; print(math.floor(3.7) + math.ceil(-2.3))

(a) 1 (b) 2 (c) 0 (d) 6

Q9. Which of the following group functions ignore NULL values?

(a) MAX (b) All of these (c) SUM (d) COUNT

Q10. _____ is a number of tuples in a relation.

(a) Attribute (b) Degree (c) Domain (d) Cardinality

Q11. Which operator returns either True or False?

(a) += (b) -= (c) *= (d) !=

Q12. Which statement gives an error?

```
Stud={"Murugan":100, "Mithu":95} # Statement 1
print(Stud[95])              # Statement 2
Stud["Murugan"]=99           # Statement 3
print(Stud.pop())            # Statement 4
print(Stud)                  # Statement 5
```

(a) Statement 2 (b) Statement 3 (c) Statement 4 (d) Statements 2 and 4

Q13. Syntax: file_object.seek(offset, reference_point). Default reference_point?

(a) 0 (b) 1 (c) 2 (d) 3

Q14. Predict output: x=[1,2,3]; y=x; y[0]=4; print(x[0])

(a) 1 (b) 4 (c) Error (d) None

Q15. In CSV, writerows([[1,2],[3,4]]) creates how many rows?

(a) 1 (b) 2 (c) 4 (d) Error

Q16. Predict output: L=[i for i in range(5) if i%2==0]; print(L[-1])

(a) 4 (b) 3 (c) 2 (d) 1

Q17. Fetchall method returns a:

(a) Tuple of lists (b) List of tuples (c) List of strings (d) Tuple of strings

Q18. _____ clause displays data in sorted form with respect to a column.

(a) Group By (b) Order By (c) Distinct (d) Where

Q19. Open file "c:\pat.txt" for writing only in binary format:

(a) fout = open("c:\\pat.txt", "wb") (b) fout = open("c:\pat.txt", "w+")

(c) fout = open("c:\\pat.txt", "w+b") (d) fout = open("c:\pat.txt", "w")

Q20. Assertion (A): To use a function from a module, we need to import the module.

Reason (R): Import statement can be written anywhere before using the function.

(a) Both A and R true, R correct explanation (b) Both A and R true, R not correct

(c) A true, R false (d) A false, R true

Q21. Assertion (A): A stack is a FIFO structure.

Reason (R): New element pushed always gets positioned at the index after the last element.

(a) Both A and R true, R correct explanation (b) Both A and R true, R not correct

(c) A true, R false (d) A false, R true

==========

SECTION B (2 Marks Each)

==========

Q22. (a) L = ["Aman", "Ankit", "Ashish", "Rajan", "Rajat"]. Find output of print(L[-1:-4:-1])

(b) tupl = (10, 20, 30, (10, 20, 30), 40). Find output of print(tupl.index(20))

Q23. Explain "Alternate Key" with an example.

Q24. (a) Differentiate between wired and wireless transmission.

OR

(b) Differentiate between URL and domain name with an example.

Q25. (a) Differentiate between CHAR and VARCHAR with an example.

OR

(b) Explain the purpose of any two DDL and any two DML commands with syntax.

Q26. Find output:

```
def short_sub(lst, n):
    for i in range(0, n):
        if len(lst) > 4: lst[i] = lst[i] + lst[i]
        else: lst[i] = lst[i]
subject = ['CS', 'HINDI', 'PHYSICS', 'CHEMISTRY', 'MATHS']
```

short_sub(subject, 5)
print(subject)

Q27. Write a function that searches for a character in "PARA.txt" and prints its occurrence count.

Q28. Differentiate between: 'import math' and 'from math import *'

==========

SECTION C (3 Marks Each)

==========

Q29. Write Python function LongLines() to read 'LINES.TXT' and display lines with >= 10 words.

Q30. Write a function Push(Vehicle) in Python to push vehicle names made by "TATA" to a stack.

Vehicle = {"Santro":"Hyundai", "Nexon":"TATA", "Safari":"Tata"}

Q31. Given tables Student and Activity, predict the outputs of:

a) SELECT ActivityName, COUNT(*) FROM ACTIVITY GROUP BY ActivityName;

b) SELECT Name, Marks FROM STUDENT WHERE Marks > 75 ORDER BY Marks ASC;

c) SELECT Name, Marks + 5 AS UpdatedMarks FROM STUDENT WHERE Section = 'A';

==========

SECTION D (4 Marks Each)

==========

Q32. Write 2 differences between CSV and text files. Write user-defined functions:

i) COURIER_ADD(): Appends records [cid, sname, Source, destination] to 'courier.csv'

ii) COURIER_SEARCH(): Inputs destination, displays matching courier records.

Q33. Using Student and Activity tables, write SQL queries to:

a) Display the number of students in each section.

b) Display RollNo, Name, and Marks of all students in descending order of Marks.

c) Display each ActivityName with total hours spent.

d) Find the average marks of students in section 'B'.

Q34. Create a function to update the 'stock' field matching a given 'prod_code' inside binary file "PRODUCT.DAT" containing dictionaries: {"prod_code": val, "prod_desc": val, "stock": val}

Q35. What is GROUP BY in MySQL? How is it different from ORDER BY? Write an SQL example for both.

==========

SECTION E (5 Marks Each)

==========

Q36. a) Find output:

def makenew(mystr):

```
    newstr=''; count = 0
    for i in mystr:
      if count%2!=0: newstr+=str(count)
      else:
        if i.lower(): newstr+=i.upper()
        else: newstr+=i
        count+=1
    print(newstr)
makenew('No@1')
```

b) Write python-sql connectivity code to read table employee and print records where City='Delhi'.

Q37. Network case study layout:

[Business School] [Technology School]

[Law School] [Admin Centre]

Distances: Law-Business: 60m, Law-Tech: 90m, Law-Admin: 115m, Business-Tech: 40m, Business-Admin: 45m, Tech-Admin: 25m.

Computers: Law: 25, Tech: 50, Admin: 125, Business: 35.

a) Suggest best building for server installation with reason.

b) Suggest ideal layout topology for wired connections.

c) Suggest hardware device to connect internal computer nodes.

d) Network type formed linking city office 350km away? (LAN/MAN/WAN)

e) Suggest repeater placement based on layout.

BRAIN INTERNATIONAL SCHOOL

PRACTICE PAPER 2

Subject – Computer Science (083)

CLASS XII

SECTION A (1 Mark Each)

Q1. State True or False: "A Python function can return multiple values packed together as a list by default."

Q2. Which of the following is a valid identifier name in Python?

(a) 2nd_num

(b) total-marks

(c) _final_amt

(d) return

Q3. Predict the output of the following expression:

python

print('tech'[1:3] * 3)

Use code with caution.

(a) ececec

(b) tctctc

(c) echech

(d) cccccc

Q4. Which of the following protocol suites handles secure data transfer across the World Wide Web?

(a) HTTP

(b) HTTPS

(c) FTP

(d) SMTP

Q5. In which network topology are all communication nodes connected directly to a single shared linear cable?

(a) Ring

(b) Star

(c) Bus

(d) Mesh

Q6. Select the correct output of the following snippet:

python

Msg = "Informatics Practices"

print(Msg.split("a"))

Use code with caution.

(a) ('Inform', 'tics Pr', 'ctices')

(b) ['Inform', 'tics Pr', 'ctices']

(c) ['Inform', 'tics', 'Practices']
(d) ('Inform', 'tics', 'Practices')

Q7. Which file handling mode opens a text file for reading and writing simultaneously, raising an error if the file does not exist?
(a) w+
(b) r+
(c) a+
(d) wb+

Q8. Find the output of the following math expression:
python
import math
print(math.ceil(4.2) + math.floor(-1.7))
Use code with caution.
(a) 3
(b) 4
(c) 2
(d) 5

Q9. Which aggregate function returns the total count of all non-NULL records present within a specific column?
(a) COUNT(*)
(b) SUM()
(c) COUNT(column_name)
(d) TOTAL()

Q10. The parameter that specifies the total count of attributes/columns inside a relation is termed as:
(a) Cardinality
(b) Domain
(c) Degree
(d) Tuple

Q11. Which of the following operators carries out floor division operations in Python?
(a) /
(b) %
(c) //
(d) div

Q12. What will be the output of the following code snippet?
python
Info = {"A": 10, "B": 20}
Info.update({"C": 30})
print(len(Info))
Use code with caution.

(a) 2
(b) 3
(c) 4
(d) Error

Q13. What integer argument is passed to file_object.seek() to specify that the offset must be calculated from the current file position?
(a) 0
(b) 1
(c) 2
(d) -1

Q14. Predict the output of the following list mutability code block:
python
a = [10, 20, 30]
b = list(a)
b[0] = 40
print(a)
Use code with caution.
(a) [10, 20, 30]
(b) [40, 20, 30]
(c) Error
(d) [10]

Q15. Which character acts as the default line-terminator/row-separator mechanism inside a standard CSV file?
(a) \t
(b) \n
(c) ,
(d) ;

Q16. Predict the output of the following expression list parsing segment:
python
M = [x for x in range(1, 6) if x % 2 != 0]
print(M[1])
Use code with caution.
(a) 1
(b) 3
(c) 5
(d) IndexError

Q17. Which database constraint forces an attribute to reject any blank or unassigned values?
(a) UNIQUE
(b) PRIMARY KEY

(c) NOT NULL
(d) DEFAULT

Q18. Which statement clause evaluates records against matching conditions prior to clustering operations?
(a) HAVING
(b) WHERE
(c) GROUP BY
(d) ORDER BY

Q19. Which module is explicitly imported to execute object serialization and deserialization processes for binary files?
(a) os
(b) csv
(c) pickle
(d) sys

Q20. Assertion (A): Local variables declared inside a function block cannot be accessed directly outside that function block.
Reason (R): The lifecycle scope of a local variable is strictly confined to the execution span of its defining function.
(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.

Q21. Assertion (A): A queue data structure adheres to LIFO (Last In First Out) methodology.
Reason (R): Insertion operations inside a linear queue consistently happen at the Rear end position pointer.
(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.

SECTION B (2 Marks Each)

Q22. (a) Given the declaration: StrVal = "PRACTICE". Write the output of: print(StrVal[-2:-7:-2])

(b) Given the nested tuple: TplData = (11, 22, [33, 44], 55). Is the statement TplData[2][0] = 99 valid? Justify.

Q23. Define the role of a Candidate Key in database configurations. How does it transition into a Primary Key?

Q24. (a) Differentiate between Microwave transmission and Radio wave transmission based on frequency and propagation mode.

OR

(b) Distinguish between a Web Browser and a Web Server by highlighting one fundamental operational difference.

Q25. (a) Differentiate between the DROP TABLE statement and the ALTER TABLE statement regarding structural modification layout.

OR

(b) Explain the difference between single-row functions and aggregate functions in SQL with one example of each.

Q26. Write the output generated by the execution of the following function script:

```
python
def update_val(vals):
   for idx in range(len(vals)):
      if vals[idx] % 3 == 0:
         vals[idx] //= 3
      else:
         vals[idx] *= 2

numbers = [3, 5, 9, 10]
update_val(numbers)
print(numbers)
Use code with caution.
```

Q27. Write a user-defined function inside Python that counts the total number of sentences inside a plain text file named "STORY.txt" by scanning for the occurrence count of period ('.') characters.

Q28. What are the advantages of modular programming models? Explain how standard function modules help isolate variable namespaces.

SECTION C (3 Marks Each)

Q29. Define a user-defined function named FindUpperLines() inside Python that reads an external text file titled "NOTES.TXT" and prints out only those lines that begin with an uppercase vowel character (A, E, I, O, U).

Q30. Write a Python module function named Push_Even(Data_List) where Data_List contains arbitrary numeric items. The routine must extract all numbers that are divisible by 2 and push them into a list-backed stack array, displaying the updated layout state.

Q31. Consider the relational structures detailed within the tables WORKER and DEPARTMENT:

Table: WORKER

W_ID	Name	Salary	DeptCode	JoinDate
W01	Rajesh	45000	D10	2021-04-12
W02	Sunita	62000	D20	2020-11-18
W03	Vikram	38000	D10	2022-01-15

W04 Kavita 55000 D30 2019-08-24

Table: DEPARTMENT

DeptCode	DeptName	Location
D10	Accounts	Mumbai
D20	Admin	Delhi
D30	Logistics	Noida

Predict the exact textual output layout generated by evaluating the following SQL queries:
(a) SELECT DeptCode, AVG(Salary) FROM WORKER GROUP BY DeptCode;
(b) SELECT Name, DeptName FROM WORKER W, DEPARTMENT D WHERE W.DeptCode = D.DeptCode AND Salary > 40000;
(c) SELECT UPPER(Name) FROM WORKER WHERE JoinDate LIKE '2021%';

SECTION D (4 Marks Each)

Q32. Point out two functional traits that differentiate standard text files from binary storage files. Write a comprehensive Python program compiling the following tracking tools:

- STOCK_WRITE(): Grabs raw material entry details from interactive prompts and appends row listings structured as [item_id, item_desc, supplier_name, unit_cost] into a resource file named "inventory.csv".
- STOCK_FILTER(): Takes a supplier name keyword search parameter and displays all corresponding item rows sourced from that enterprise.

Q33. Utilizing the structural metrics from the WORKER and DEPARTMENT relational tables in **Q31**, draft the correct SQL statement strings for the following tracking specifications:
(a) Show the highest and lowest salary metrics recorded within the database system.
(b) Display the names of workers in alphabetical order who joined the business after January 1st, 2021.
(c) Fetch details showing unique locations alongside the aggregate count of workers deployed at each site.
(d) Increase the salary variable fields by a 5% factor across all staff members matched to DeptCode 'D10'.

Q34. A binary data store file named "CLIENT.DAT" indexes nested structures formatted as dictionaries matching the blueprint layout: {"c_id": code, "c_name": profile, "balance": decimal_val}.
Write a user-defined Python solution function that searches for records matching a specific c_id input. If located, update the client's balance fields with a new value provided via user input prompts, saving the modified state.

Q35. Detail the behavioral constraints of the HAVING statement clause in MySQL. How does its operational evaluation scope contrast with the filtering boundaries of the WHERE keyword? Demonstrate using explicit SQL code snippets for both styles.

SECTION E (5 Marks Each)

Q36. (a) Trace the manual data routing execution and deduce the final console print layout of the code snippet below:

python

```
def evaluate_string(source_str):
    target_str = ""
    for idx in range(len(source_str)):
        if idx % 2 == 0 and source_str[idx].isalpha():
            target_str += source_str[idx].lower()
        elif source_str[idx].isdigit():
            target_str += str(int(source_str[idx]) * 2)
        else:
            target_str += "#"
    print(target_str)

evaluate_string("Code2026")
```

Use code with caution.

(b) Code a comprehensive Python-to-MySQL connectivity routine using standard connectors that retrieves and prints rows from a tracking registry table named item (housed inside database store complex named warehouse) matching the condition context where unit_price exceeds 1500.

Technical Setup Attributes:

- **Database Access Username:** root | **Account Security Password:** password
- **Relational Target Fields:** item_code (String), description (String), quantity (Integer), unit_price (Float)

Q37. Apex Learning Academy is launching its technology infrastructure blocks across an engineering compound site and needs to formulate a secure localized networking topology. The project encompasses 3 technical department layouts and a centralized Executive Directorate workspace.

text

```
[ Training Block ]          [ Placement Block ]


[ Research Block ]          [ Directorate Centre ]
```

Use code with caution.

Measured Core Distance Spans:

- Training Block to Placement Block = 55 m
- Training Block to Research Block = 85 m
- Training Block to Directorate Centre = 130 m
- Placement Block to Research Block = 70 m

- Placement Block to Directorate Centre = 35 m
- Research Block to Directorate Centre = 45 m

Workstation Density Indicators:

- Training Block: 45 connected computers
- Placement Block: 30 connected computers
- Research Block: 60 connected computers
- Directorate Centre: 140 connected computers

Analyze the constraints and fulfill the following infrastructure planning requests:

(a) Determine the best location block to house the localized campus server node infrastructure. Defend your choice.

(b) Formulate an economic wired cabling topology layout connecting all four operational blocks that minimizes the overall cable distance.

(c) Select the specific networking hardware module that must be fitted internally within each block to switch traffic between the local computer hosts.

(d) The management decides to connect this campus network via microwave technology lines to its rural outreach center situated 45 km away. Classify the resulting structural network profile scope (LAN, MAN, or WAN) with valid justification.

(e) Evaluate your cabling layout choice in part (b) and state between which physical block segments network signal **Repeaters** must be placed to manage packet degradation.