A3-R5 : PROGRAMMING AND PROBLEM SOLVING THROUGH PYTHON

अवधि : 03 घंटे
DURATION : 03 Hours

अधिकतम अंक : 100
MAXIMUM MARKS : 100

ओएमआर शीट सं. : OMR Sheet No. :					

रोल नं. : Roll No. :

उत्तर-पुस्तिका सं. : Answer Sheet No. :

परीक्षार्थी का नाम :
Name of Candidate : _____

परीक्षार्थी के हस्ताक्षर :
Signature of Candidate : _____

परीक्षार्थियों के लिए निर्देश :	Instructions for Candidate :
कृपया प्रश्न-पुस्तिका, ओएमआर शीट एवं उत्तर-पुस्तिका में दिये गए निर्देशों को ध्यानपूर्वक पढ़ें।	Carefully read the instructions given on Question Paper, OMR Sheet and Answer Sheet.
प्रश्न-पुस्तिका की भाषा अंग्रेजी है। परीक्षार्थी केवल अंग्रेजी भाषा में ही उत्तर दे सकता है।	Question Paper is in English language. Candidate can answer in English language only.
इस मॉड्यूल/पेपर के **दो भाग** हैं। **भाग एक** में **चार** प्रश्न और **भाग दो** में **पाँच** प्रश्न हैं।	There are **TWO PARTS** in this Module/Paper. **PART ONE** contains **FOUR** questions and **PART TWO** contains **FIVE** questions.
भाग एक ''वैकल्पिक'' प्रकार का है जिसके कुल अंक 40 है तथा **भाग दो** ''व्यक्तिपरक'' प्रकार का है और इसके कुल अंक 60 है।	**PART ONE** is Objective type and carries 40 Marks. **PART TWO** is Subjective type and carries 60 Marks.
भाग एक के उत्तर, **ओएमआर उत्तर-पुस्तिका** पर ही दिये जाने हैं। **भाग दो** की उत्तर-पुस्तिका में **भाग एक** के उत्तर **नहीं** दिये जाने चाहिए।	**PART ONE** is to be answered in the **OMR ANSWER SHEET** only. **PART ONE** is **NOT** to be answered in the answer book for **PART TWO**.
भाग एक के लिए अधिकतम समय सीमा **एक घण्टा** निर्धारित की गई है। **भाग दो** की उत्तर-पुस्तिका, **भाग एक** की उत्तर-पुस्तिका जमा कराने के पश्चात् दी जाएगी। तथापि, निर्धारित एक घंटे से पहले **भाग एक** पूरा करने वाले परीक्षार्थी **भाग एक** की उत्तर-पुस्तिका निरीक्षक को सौंपने के तुरंत बाद, **भाग दो** की उत्तर-पुस्तिका ले सकते हैं।	Maximum time allotted for **PART ONE** is **ONE HOUR**. Answer book for **PART TWO** will be supplied at the table when the Answer Sheet for **PART ONE** is returned. However, Candidates who complete **PART ONE** earlier than one hour, can collect the answer book for **PART TWO** immediately after handing over the Answer Sheet for **PART ONE** to the Invigilator.
परीक्षार्थी, उपस्थिति-पत्रिका पर हस्ताक्षर किए बिना और अपनी उत्तर-पुस्तिका, निरीक्षक को सौंपे बिना, परीक्षा हॉल/कमरा नहीं छोड़ सकते हैं। ऐसा नहीं करने पर, परीक्षार्थी को इस मॉड्यूल/पेपर में अयोग्य घोषित कर दिया जाएगा।	**Candidate cannot leave the examination hall/room without signing on the attendance sheet and handing over his/her Answer Sheet to the invigilator. Failing in doing so, will amount to disqualification of Candidate in this Module/Paper.**
प्रश्न-पुस्तिका को खोलने के निर्देश मिलने के पश्चात् एवं उत्तर लिखना आरम्भ करने से पहले उम्मीदवार जाँच कर यह सुनिश्चित कर लें कि प्रश्न-पुस्तिका प्रत्येक दृष्टि से संपूर्ण है।	After receiving the instruction to open the booklet and before starting to answer the questions, the candidate should ensure that the Question Booklet is complete in all respect.

जब तक आपसे कहा न जाए, तब तक प्रश्न-पुस्तिका न खोलें।
DO NOT OPEN THE QUESTION BOOKLET UNTIL YOU ARE TOLD TO DO SO.

PART ONE

(Answer all the questions)

1. Each question below gives a multiple choice of answers. Choose the most appropriate one and enter in the "OMR" answer sheet supplied with the question paper, following instructions therein. **(1x10)**

1.1 Find the output of following Python Programs.

```
a = "Meetmeafterparty"
b = 13
print a + b
```

(A) 29 (B) 14

(C) error in code (D) 15

1.2 Find the output of the following Python programs.

```
class Acc:
def_init_(self, id):
self.id = id
id = 555
acc = Acc(111)
print acc.id
```

(A) 111 (B) 555

(C) 666 (D) error in code

1.3 Which of the following is an invalid variable ?

(A) my_string_1

(B) foo

(C) _

(D) 1st_string

1.4 Find the output of the following Python programs.

```
x = ['ab', 'cd']
for i in x:
i.upper()
print(x)
```

(A) ab

(B) cd

(C) ['ab', 'cd']

(D) ['cd', 'ab']

1.5 What is the output of the following program ?

```
a = 2
b = '3.77'
c = -8
str1 = '{0:.4f} {0:3d} {2} {1}'. format (a, b, c)
print(str1)
```

(A) 2.0000 2 -8 3.77

(B) 23.77 -8 3.77

(C) 2.000 3 -8 3.77

(D) 2.000 2 8 3.77

1.6 Find out the output of the following Python programs.

```
def gfg(x,l=[ ]):
for i in range(x):
l.append(i*i)
print(l)
gfg(2)
```

(A) [3, 2, 1, 0, 1, 4]

(B) [0, 1]

(C) [0, 1, 0, 1, 4]

(D) error in code

1.7 Suppose t = (1, 2, 4, 3), which of the following is incorrect ?

(A) print (t [3])

(B) t [3] = 45

(C) print(max(t))

(D) print (Len(t))

1.8 What will be the output of the following Python code ?

```
>>>t1=(1, 2, 4, 3)
>>>t2=(1, 2, 3, 4)
>>>t1<t2
```

(A) True (B) False

(C) Error (D) (1, 2, 4, 3)

1.9 Which of the following statements is false about recursion ?

(A) Every recursive function must have a base case

(B) Infinite recursion can occur if the base case isn't properly mentioned

(C) A recursive function makes the code easier to understand

(D) Every recursive function must have a return value

1.10 What will be the output of the following Python code ?

```
import functools
l=[1, 2, 3, 4, 5]
m=functools.reduce(lambda x, y:x if x>y else y, l)
print(m)
```

(A) Error

(B) Address of m

(C) 1

(D) 5

2. Each statement below is either TRUE or FALSE. Choose the most appropriate one and enter your choice in the "OMR" answer sheet supplied with the question paper, following instructions therein. **(1x10)**

2.1 Python is a high-level, interpreted, interactive and object-oriented scripting language. It is designed to be highly unreadable.

2.2 Python is derived from many other languages, including ABC, Modula-3, C, C++, Algol-68, SmallTalk, and Unix shell and other scripting languages.

2.3 In Python assignment of more than one behaviour to a particular function and the operation performed varies by the types of objects or arguments involved are known as operator overloading.

2.4 To access values in tuple, use the square brackets for slicing along with the index or indices to obtain value available at that index.

2.5 The Python standard for database interfaces is the Python SB-API. Most Python database interfaces adhere to this standard.

2.6 If a connection is established with the datasource, then a Connection Object is returned and saved into db for further use, otherwise db is set to None.

2.7 The tell() method tells you the current position within the file.

2.8 Removing individual tuple elements is possible.

2.9 The first method __init__() is a special method, which is called class constructor or initialization method that Python calls when you create a new instance of this class.

2.10 When a Python script raises an exception, it must either handle the exception immediately otherwise it terminates and quits.

3. **Match words and phrases in column X with the closest related meaning/word(s)/ phrase(s) in column Y. Enter your selection in the "OMR" answer sheet supplied with the question paper, following instructions therein.** **(1x10)**

	Column X		Column Y
3.1	Error does not fall into any category	**A**	time.altzone
3.2	The arguments have invalid values specified	**B**	tuple(seq)
3.3	Opens a file for both reading and writing in binary format	**C**	tell()
3.4	Function blocks begin with the keyword	**D**	ValueError
3.5	Negative count from the right	**E**	rb+
3.6	Method displays the current working directory	**F**	RuntimeError
3.7	The offset of the local DST time zone	**G**	L[-2]
3.8	Converts a list into tuple	**H**	def
3.9	Shows current position within the file	**I**	del
3.10	explicitly remove an entire tuple	**J**	getcwd()
		K	SyntaxError
		L	Rb-
		M	L[-1]

4. Each statement below has a blank space to fit one of the word(s) or phrase(s) in the list below. Enter your choice in the "OMR" answer sheet attached to the question paper, following instructions therein. **(1x10)**

(A)	time.time()	**(B)**	24	**(C)**	parentheses	**(D)**	reference
(E)	more	**(F)**	local variables	**(G)**	TRUE	**(H)**	Guido van Rossum
(I)	function	**(J)**	objects	**(K)**	less	**(L)**	FALSE
(M)	Tim Berner						

4.1 The output of following python program is _____.

```
r = lambda q: q * 2
s = lambda q: q * 3
x = 2
x = r(x)
x = s(x)
x = r(x)
print x
```

4.2 Let consider the following python code

```
a = True
b = False
c = False
if a or b and c:
print "TRUE"
else:
print "FALSE"
```

the output of this code is _____.

4.3 Recursive functions usually take _____ memory space than non-recursive function.

4.4 Python programming language was created by _____.

4.5 Python supports Object-Oriented style or technique of programming that encapsulates code within _____.

4.6 _____ returns the current time instant, a floating-point number of seconds since the epoch.

4.7 All parameters (arguments) in the Python language are passed by _____.

4.8 The _____ can be accessed only inside the function in which they are declared, whereas global variables can be accessed throughout the program body by all functions.

4.9 The differences between tuples and lists are, the tuples cannot be changed unlike lists and tuples use _____, whereas lists use square brackets.

4.10 Python converts numbers internally in an expression containing mixed types to a Common type for evaluation. But sometimes, coerce a number explicitly from one type to another to satisfy the requirements of _____ parameter.

PART TWO

(Answer any FOUR questions)

5. (a) Write the basic steps required by the interpreter to execute a python program.

(b) Predict and explain the output of following program

```
r = lambda q: q * 2
s = lambda q: q * 3
x = 2
x = r(x)
x = s(x)
x = r(x)
print x
```

(c) How memory is managed in Python ? Give the tools name that help to find bugs or perform static analysis ? **(5+5+5)**

6. (a) Write a Python program to compute the factorial of a given number using recursion.

(b) Define mutable and immutable data type. Explain the concept of Linear and Binary search with Python program.

(c) Write code snippets in Python to perform Accessing Elements of a Tuple. **(3+8+4)**

7. (a) How will you create a Package & import it ? Explain it with an example program.

(b) Explain the following :

(i) List Slicing

(ii) List Accessing Methods **(7+8)**

8. (a) Illustrate the LEGB rules and its significance with help of suitable diagram.

(b) Explain about Python slice. Write the syntax of slice and discuss about it. **(7+8)**

9. (a) Define NumPy ? How to Create NumPy Array ?

(b) Explain Flowchart and symbols used in flowchart. Write the Algorithm, pseudo code and draw the flowchart for Towers of Hanoi. **(6+9)**

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SPACE FOR ROUGH WORK

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