

Indian Institute of Technology, Madras - BS in Data Science and Applications

Notations :

- 1.Options shown in green color and with ✓ icon are correct.
- 2.Options shown in red color and with ✗ icon are incorrect.

Question Paper Name :

IIT M FOUNDATION AN4 EXAM QPF4 16
JULY 2023

Subject Name :

2023 July: IIT M FOUNDATION AN4 EXAM
QPF4

Creation Date :

2023-07-10 18:54:05

Duration :

240

Total Marks :

705

Display Marks:

Yes

Share Answer Key With Delivery Engine :

Yes

Actual Answer Key :

Yes

Calculator :

Scientific

Magnifying Glass Required? :

No

Ruler Required? :

No

Eraser Required? :

No

Scratch Pad Required? :

No

Rough Sketch/Notepad Required? :

No

Protractor Required? :

No

Show Watermark on Console? :

Yes

Highlighter :

No

Auto Save on Console?

Yes

Change Font Color :

No

6406531928641. ✖ Can't determined.

Sem2 Intro to Python

Section Id :	64065339055
Section Number :	5
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	17
Number of Questions to be attempted :	17
Section Marks :	50
Display Number Panel :	Yes
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	64065382486
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 90 Question Id : 640653577524 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "FOUNDATION LEVEL : SEMESTER 2:
INTRODUCTION TO PYTHON (COMPUTER BASED EXAM)"

ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?

CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.

(IF IT IS NOT THE CORRECT SUBJECT, PLS CHECK THE SECTION AT THE TOP FOR THE SUBJECTS REGISTERED BY YOU)

Options :

6406531928642. ✓ YES

6406531928643. ✗ NO

Question Number : 91 Question Id : 640653577525 Question Type : MCQ Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 0

Question Label : Multiple Choice Question

Presentation

There are two types of blocks that you would see in all the questions:

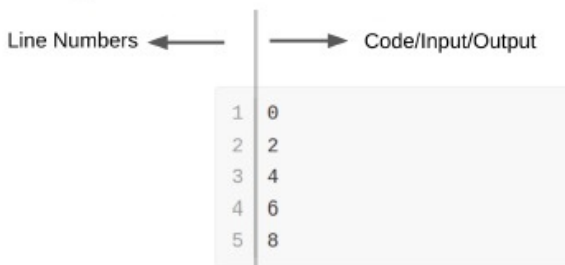
Code

```
1 for i in range(10):
2     if i % 2 == 0:
3         print(i)
```

Input or Output

```
1 0
2 2
3 4
4 6
5 8
```

In both the blocks, please note that the region to the left of the thin vertical line — | — corresponds to line-numbers. Do not confuse the line numbers with the content of the code or the input-output. Just to be clear:



Useful information

range

Sample behaviour of the `range` function:

- `range(5)` corresponds to the sequence `0, 1, 2, 3, 4`
- `range(1, 5)` corresponds to the sequence `1, 2, 3, 4`
- `range(1, 1)` is the empty sequence

// operator

// is the floor division operator. `5 // 2` is 2 and *not* 2.5

NAT → integer

For all NAT questions in this exam, the answer will always be an integer and not a float value. If the answer to a question is 18, then just enter that value. Do *not* enter 18.0

Options :

6406531928644. ✓ Useful Data has been mentioned above.

6406531928645. ✗ This data attachment is just for a reference & not for an evaluation.

Sub-Section Number :

2

Sub-Section Id :

64065382487

Question Shuffling Allowed :

Yes

Is Section Default? :

null

Question Number : 92 Question Id : 640653577526 Question Type : MCQ Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

Consider the following code snippet:

```
1 x = int(input())
2 y = int(input())
3 if x > 5:
4     if y > 15:
5         print("A")
```

For what values as input, after execution, the above code snippet does **not** produce **any output** but runs without any error?

Options :

6406531928646. ✖ x = 10 and y = 25

6406531928647. ✖ x = 6 and y = 20

6406531928648. ✔ x = 12 and y = 15

6406531928649. ✖ x = 15 and y = 16

Question Number : 93 Question Id : 640653577527 Question Type : MCQ Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

What is the output of the following code?

```
1 str1 = "Python"
2 str2 = "Programming"
3 str3 = str1 + " " + str2[:8] #There is single space in between quotes
4 print(len(str3))
```

Options :

6406531928650. ✓ 15

6406531928651. ✗ 14

6406531928652. ✗ 11

6406531928653. ✗ 12

Question Number : 94 Question Id : 640653577529 Question Type : MCQ Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

Consider the following code snippet:

```
1 days = int(input())
2
3 years = days // 365
4 weeks = (days % 365) // 7
5 remaining_days = (days % 365) % 7
6
7 print("Years:", years)
8 print("Weeks:", weeks)
9 print("Days:", remaining_days)
```

What will be the output if the input `days` is 437?

Options :

6406531928658. ✓ Years: 1, Weeks: 10, Days: 2

6406531928659. ✗ Years: 2, Weeks: 10, Days: 3

6406531928660. ✗ Years: 1, Weeks: 62, Days: 2

6406531928661. ✗ Years: 2, Weeks: 22, Days: 2

Question Number : 95 Question Id : 640653577530 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

Consider the following Python code snippet:

```
1 x = 15
2 y = 20
3 if x > y:
4     result = x - y
5 elif x < y:
6     result = y - x
7 else:
8     result = x + y
9
10 print(result)
```

What will be the output when you run the above snippet of code?

Options :

6406531928662. ✓ 5

6406531928663. ✗ 20

6406531928664. ✗ 35

6406531928665. ✗ 15

Sub-Section Number : 3

Sub-Section Id : 64065382488

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 96 Question Id : 640653577528 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the following code snippet:

```
1  a = 4
2  b = 7
3  c = int(input())
4  if a > b:
5      if b > c:
6          print("A")
7      elif a > c:
8          print("B")
9      else:
10         print("C")
11 else:
12     if b < c:
13         print("D")
14     else:
15         print("E")
```

Based on the above snippet of code, which of the following options is correct ?

Options :

6406531928654. ✖ If c = 5, then the output generated is "D"

6406531928655. ✖ If c = 10, then the output generated is "E"

6406531928656. ✔ If c >= 8, then the output is always "D"

6406531928657. ✖ If c < 7, then the output generated is always "D"

Question Number : 97 Question Id : 640653577532 Question Type : MCQ Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

What will be the output of the code snippet given below?


```

1 | a = 5
2 | b = 5
3 | for x in range(0,a):
4 |     for y in range(b-x,1,-1):
5 |         print(y,end=' ')
6 |     print(1)

```

Options :

```

1 | 1
2 | 2 1
3 | 3 2 1
4 | 4 3 2 1
5 | 5 4 3 2 1

```

6406531928670. ✖

```

1 | 5 4 3 2 1
2 | 4 3 2 1
3 | 3 2 1
4 | 2 1
5 | 1

```

6406531928671. ✔

```

1 | 1 2 3 4 5
2 | 1 2 3 4
3 | 1 2 4
4 | 1 2
5 | 1

```

6406531928672. ✖

```

1 | 1
2 | 1 2
3 | 1 2 3
4 | 1 2 3 4

```

6406531928673. ✖

```

1 | 5 4 3 2 1
2 | 4 3 2 1
3 | 3 2 1
4 | 2 1

```

6406531928674. ✖

Sub-Section Number : 4
Sub-Section Id : 64065382489
Question Shuffling Allowed : Yes
Is Section Default? : null

Question Number : 98 Question Id : 640653577531 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

Select an appropriate code snippet that can shift the given key `zamzamsayzam` by two places along the alphabet and generates the encrypted key `bcobcoubcabco`.

Options :

```
1 alphabet = 'abcdefghijklmnopqrstuvwxyz'
2 key = 'zamzamsayzam'
3 encrypt_key = ''
4 for i in key:
5     encrypt_key = encrypt_key + (alphabet[(((alphabet.index(i))*2)%26)])
6 print(encrypt_key)
```

6406531928666. ✖

```
1 alphabet = 'abcdefghijklmnopqrstuvwxyz'
2 key = 'zamzamsayzam'
3 encrypt_key = ''
4 for i in key:
5     encrypt_key = encrypt_key + (alphabet[(((alphabet.index(i))+2)%25)])
6 print(encrypt_key)
```

6406531928667. ✖

```
1 alphabet = 'abcdefghijklmnopqrstuvwxyz'
2 key = 'zamzamsayzam'
3 encrypt_key = ''
4 for i in key:
5     encrypt_key = encrypt_key + (alphabet[(((alphabet.index(i))+2)//26)])
6 print(encrypt_key)
```

6406531928668. ✖

```

1 alphabet = 'abcdefghijklmnopqrstuvwxyz'
2 key = 'zamzamsayzam'
3 encrypt_key = ''
4 for i in key:
5     encrypt_key = encrypt_key + (alphabet[(((alphabet.index(i))+2)%26)])
6 print(encrypt_key)

```

6406531928669. ✓

Question Number : 99 Question Id : 640653577533 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

Select an appropriate code snippet that calculate the sum of a series up to n terms. The series defined here for $n = 5$ is given in below example.

1 | 1 + 12 + 123 + 1234 + 12345 = 13715

Options :

```

1 num_terms = 5
2 start_num = 1
3 sum_of_seq = 0
4 for i in range(1, num_terms+1):
5     start_num = start_num * 10 + (i+1)
6     sum_of_seq += start_num
7 print(sum_of_seq)

```

6406531928675. ✖

```

1 num_terms = 5
2 start_num = 1
3 sum_of_seq = 0
4 for i in range(1, num_terms):
5     start_num = start_num * 10 + (i+1)
6     sum_of_seq += start_num
7 print(sum_of_seq)

```

6406531928676. ✖

```

1 num_terms = 5
2 start_num = 1
3 sum_of_seq = 0
4 for i in range(1, num_terms+1):
5     sum_of_seq += start_num
6     start_num = start_num * 10 + (i+1)
7 print(sum_of_seq)

```

6406531928677. ✓

```

1 num_terms = 5
2 start_num = 1
3 sum_of_seq = 0
4 for i in range(1, num_terms):
5     sum_of_seq += start_num
6     start_num = start_num * 10 + (i+1)
7 print(sum_of_seq)

```

6406531928678. ✗

Question Number : 100 Question Id : 640653577535 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

Consider the following Python snippet:

```

1 num = int(input("Enter a number"))
2 r_num = 1
3 while num != 0:
4     digit = num % 10
5     r_num = r_num * 10 + digit
6     num //= 10
7 print(r_num)

```

Assume that 2345 is passed as input to the code. Which of the following option is the correct output for the given input?

Options :

6406531928683. ✖ 5432

6406531928684. ✔ 15432

6406531928685. ✖ 2345

6406531928686. ✖ 12345

Question Number : 101 Question Id : 640653577536 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

Select all the code snippets that prints `Magic Number` if the number `n` leaves remainder 0 when divided by 7 but leaves the remainder 1 when the number is divided by 2, 3, 4, 5, and 6. Otherwise print `Not Magic Number`.

Options :

```
1 n = int(input())
2 flag = 0
3 for i in range(2, 7):
4     if n % i == 1:
5         flag = 1
6         break
7 if flag == 0 and n % 7 == 0:
8     print("Magic Number")
9 else:
10    print("Not Magic Number")
```

6406531928687. ✖

```
1 n = int(input())
2 flag = 0
3 for i in range(2, 7):
4     if n % i != 1:
5         flag = 1
6         break
7 if flag == 0 and n % 7 == 0:
8     print("Magic Number")
9 else:
10    print("Not Magic Number")
```

6406531928688. ✔

```

1 | n = int(input())
2 | flag = 0
3 | for i in range(2, 7):
4 |     if n % i == 0:
5 |         flag = 1
6 |         break
7 | if flag == 1 and n % 7 == 0:
8 |     print("Magic Number")
9 | else:
10 |    print("Not Magic Number")

```

6406531928689. ✖

```

1 | n = int(input())
2 | flag = 0
3 | for i in range(2, 7):
4 |     if n % (i+1) == 1:
5 |         flag = 1
6 |         break
7 | if flag == 1 or n % 7 == 0:
8 |     print("Magic Number")
9 | else:
10 |    print("Not Magic Number")

```

6406531928690. ✖

Question Number : 102 Question Id : 640653577539 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

What will be the output of the code snippet given below?

```

1 | L = [-1, 1]
2 | for i in range(8):
3 |     size = len(L)
4 |     value = (L[size - 2] + L[size - 1])*2
5 |     L.append(value)
6 | print(L)

```

Options :

6406531928696. ✖

1 | [-1, 1, 0, 1, 1, 2, 3, 5, 8, 13]

6406531928697. ✔

1 | [-1, 1, 0, 2, 4, 12, 32, 88, 240, 656]

6406531928698. ✖

1 | [-1, 1, 0, -2, -4, -12, -32, -88, -240, -656]

6406531928699. ✖

1 | [-1, 1, 0, -1, -1, -2, -3, -5, -8, -13]

Sub-Section Number :	5
Sub-Section Id :	64065382490
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 103 Question Id : 640653577534 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Max. Selectable Options : 0

Question Label : Multiple Select Question

Select all correct implementations of a program that prints the first 10 prime numbers to the console, as one number on each line. Please note that the first 10 prime numbers are less than 30 and 11th prime number is more than 30. It is a Multiple Select Question .

Options :

6406531928679. ✔


```

1 for i in range(2,30):
2     flag=False
3     for j in range(2,int(i/2)+1):
4         if(i%j==0):
5             flag=True
6             break
7     if(flag==False):
8         print(i)

```

```

1 for i in range(2,30):
2     flag=False
3     for j in range(2,i):
4         if(i%j==0):
5             flag=True
6             break
7     if(flag==False):
8         print(i)

```

6406531928680. ✓

```

1 count = 0
2 i = 2
3 while (count < 10):
4     flag = True
5     for j in range(2, i//2+1):
6         if i % j == 0:
7             flag = False
8             break
9     if flag:
10        print(i)
11        count += 1
12    i += 1

```

6406531928681. ✓

6406531928682. ✖


```

1 count = 0
2 i = 2
3 while (count < 10):
4     flag = True
5     for j in range(2, i//2+1):
6         if i % j != 0:
7             break
8         else:
9             flag = False
10    if flag:
11        print(i)
12        count += 1
13    i += 1

```

Question Number : 104 Question Id : 640653577538 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Max. Selectable Options : 0

Question Label : Multiple Select Question

```

1 # Look at the options for the value of M
2 n = len(M)
3
4 flag = True
5 for i in range(n):
6     for j in range(n):
7         if (i != j) and (M[i][j] != 0):
8             flag = False
9             break
10        elif (i == j) and M[i][j] != 1:
11            flag = False
12            break
13    if flag == False:
14        break
15 print(flag)

```

Select all matrices (list of lists) `M` for which the above snippet of code prints `True` to the console.

Options :

6406531928692. ✓ `[[1,0, 0], [0, 1, 0], [0, 0, 1]]`

6406531928693. ✖ `[[0, 1, 0, 0], [1, 0, 0, 0], [0, 0, 1, 0], [0, 0, 0, 1]]`

6406531928694. ✖ `[[1, 1, 1], [1, 1, 1], [1, 1, 1]]`

6406531928695. ✔ `[[1, 0, 0, 0], [0, 1, 0, 0], [0, 0, 1, 0], [0, 0, 0, 1]]`

Sub-Section Number : 6
Sub-Section Id : 64065382491
Question Shuffling Allowed : Yes
Is Section Default? : null

Question Number : 105 Question Id : 640653577540 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 5 Max. Selectable Options : 0

Question Label : Multiple Select Question

Reverse a sentence based on words. The i^{th} word from the left in the input sentence is the i^{th} word from the end in the output sentence.

Consider following example:

```
1 sentence = "i know how to code in python"
2 modified_sentence = "python in code to how know i"
```

Choose all the options that accepts a sentence as input and prints the modified sentence.

Options :

```
1 sentence = input()
2 words = sentence.split(' ')
3 n = len(words)
4 for i in range(n - 1, 0, -1):
5     print(words[i] + ' ', end = '')
6 print(words[0])
```

6406531928700. ✔

6406531928701. ✖

```
1 sentence = input()
2 words = sentence.split(' ')
3 n = len(words)
4 for i in range(n - 1, -2, -1):
5     print(words[i] + ' ', end = '')
```

6406531928702. ✖

```
1 sentence = input()
2 words = sentence.split(' ')
3 n = len(words)
4 for i in range(n - 1, -1, -1):
5     print(words[i] + ' ', end = '')
6 print(words[0])
```

6406531928703. ✔

```
1 sentence = input()
2 words = sentence.split(' ')
3 n = len(words)
4 for i in range(n - 1):
5     print(words[n - i - 1], end = ' ')
6 print(words[0])
```

Sub-Section Number :	7
Sub-Section Id :	64065382492
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 106 Question Id : 640653577537 Question Type : SA Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 3
Question Label : Short Answer Question

`L` is a non-empty list of distinct positive integers. That is:

- `L` has at least one element
- No two elements of `L` are the same

If the following snippet of code terminates without any error after a finite number of iterations of the while loop, what is the output produced by it?

Hint: `L.remove(x)` removes the leftmost occurrence of `x` in `L`.

```
1  # L is a non-empty list of distinct positive integers
2  # L has already been defined
3  val = 0
4  for x in L:
5      val += x
6
7  while L != []:
8      for y in range(1, 11, 2):
9          if y in L:
10             L.remove(y)
11         else:
12             L.append(y)
13
14  print(val)
```

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

25

Sem2 English2

Section Id :	64065339056
Section Number :	6
Section type :	Online
Mandatory or Optional :	Mandatory