IC 100
Tierce 1
Part 1 - Time 12 minutes

1.

a. What is the function of the Python interpreter? [Marks - 2]

b. What is the value of variable sum after execution of the following code? [Marks - 2]

```
sum=10
for number in range (1, 10, 2):
    sum += number
print(sum)
```

c. What is the output of the following code? [Marks - 1]

```
s1 = “Introduction to Programming”
print(s1[0:5]+’zr’+s1[-3:].upper())
```

d. Complete the code snippet to return the following output. [Marks - 3]

```
a = 23
b = 28
c = ((a ___ b) <<___)
print(c)
Output: 160
```

e. How many times will “Hello World” be printed in the following code? Explain your answer. [Marks - 2]

```
x=10
while x<20:
        while x<15:
                print(“Hello World”)
                if x%3==0:
                        break
                x+=1
        if x%5==0:
                continue
        print(“Hello World”)
```

IC 100
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Part 2 - Time 12 minutes

2. Write a program to find out the age of the user on 22nd July 2021, **in days**, given the date of birth of the user. The date of birth is given as three different inputs: Year, Month and Day. Please consider leap years in your calculation. You may assume that the date of birth of the user should not be before 1st January, 1920.

[Marks - 10]

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Part 3 - Time 12 minutes

3. **Twin prime** is a prime number that is either 2 less or 2 more than another prime number—for example, 41 and 43 are both twin prime numbers. Write a program to take a set of numbers (integers) from the user interactively (i.e. ask the user when to stop). For each number x, check if it is a twin prime number or not and print a message like -“x is a twin prime number“ or “x is not a twin prime number” accordingly.
Count the number of twin prime numbers entered by the user and print the count at the end of the code.

[Marks - 10]

IC 100
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Part 4 - Time 12 minutes

4. The expansion of the exponential series $e^x = 1 + x/1 + x^2/2! + x^3/3! + \ldots + x^n/n! + \ldots$. Read x and n, as inputs from the user and print the sum of the series till the n^{th} term (i.e. upto $x^n/n!$). Please note that n! denotes the factorial of n and can be calculated as 1*2*3*...*n.

[Marks - 10]

IC 100
Tierce 1
Part 5 - Time 12 minutes

5. Write a Python program to check the validity of password input by users. Validation rules -

- At least 1 letter between [a-z] and 1 letter between [A-Z].
- At least 1 number between [0-9]. Note, to check if a character is a digit or not, you can use the isdigit() method - c.isdigit() will be True if c is a digit, otherwise it would be False.
- At least 1 character from [$,#,@]. But the password should not start with any of these three characters.
- Minimum length 6 characters.
- Maximum length 16 characters.

[Marks - 6]

6. Write a Python program to print the following pattern given the height (number of rows). Please check if the given height is odd or not. The maximum width of the pattern would be the ceiling of [height/2] and the number of spaces in the beginning of the middle line would be the ceiling of [(maximum width)/4].

```
****
*
*
 ***
   *
   *
****
```

[Marks - 4]