QP CODE: 25020821

25020821

Reg No : .....

Name : .....

B.Sc DEGREE (CBCS) REGULAR / REAPPEARANCE / MERCY CHANCE EXAMINATIONS, FEBRUARY 2025

Sixth Semester

CHOICE BASED CORE COURSE - MM6CBT02 - BASIC PYTHON PROGRAMMING AND TYPESETTING IN LATEX

Common for B.Sc Mathematics Model I & B.Sc Mathematics Model II Computer Science

2017 Admission Onwards

3F46F3AA

Time: 3 Hours Max. Marks : 80

Part A

*Answer any **ten** questions.*

*Each question carries **2** marks.*

1. How to write the comments in Python? Give example.
2. Write down the output of the following codes.

```
a=4
print(a*4)
print('a'*4)
```

3. Write short note on for loop in Python.
4. What do you mean by local variable in Python? Give example.
5. What you mean by recursion in Python?
6. Explain the Boolean code ’b’ ==(‘a’ or ‘b’) in Python.
7. Write down the difference between "reference" and "copy" of an object in Python.
8. Write the output of the Python code

```
with open("text.txt","wt") as out_file:
    out_file.write("The Text is going to out file\nLook at it and see!")
with open("text.txt","rt") as in_file:
    text = in_file.read()
print(text)
```

9. Give the $LaTeX$ command for specify the style of page numbers. Also give the possible arguments to this command.

10. Write the structure to produce **bibliography** in $LaTeX$.

11. Write the $LaTeX$ code for typeset $\begin{vmatrix} a & b \\ c & d \end{vmatrix} = ad - bc$

12. Give the output of the following $LaTeX$ code.

```
\newtheorem{thm}{Theorem}
\begin{thm}[Euclid]
The sum of the angles of a triangle is $180^\circ$.
\end {thm}
```

(10×2=20)

Part B

*Answer any **six** questions.*

*Each question carries **5** marks.*

13. What you mean by the terms Repetition and Concatenation related to strings in Python? Give suitable examples in Python code.

14. Explain each code of the following. Write down the output.

```
password=str()
while password !='unicorn':
    password = input("Enter the password :")
    print("Welcome")
```

15. Explain the relational operators with example program.

16. With example program explain 'remove()', 'sort()' and 'append()' in Python list.

17. How can you remove and add an entry in a dictionary? Give example.

18. Write a Python program to check whether the given string is Palindrome or not.

19. Which are the special symbols used in $LaTeX$. Also Write the input commands to produce those symbols?

20. Explain 'itemize' environment with examples.

21. Write the output of the following $LaTeX$ code.

```
\begin{tabular}{clcr}\hline
Sl. No & Name & Mark & Rank\\
```

```
1& Abi & 30 & 3 \\
2 & Arun & 48 & 1\\
3 & Amal & 42 & 2\\
\hline      \end {tabular}
```

(6×5=30)

Part C

*Answer any **two** questions.*

*Each question carries **15** marks.*

22. (a)What is the syntax of while loop in Python?
(b)Write a program to find the product of n natural numbers.
(c)Write a program to find the 10th power of an integer.

23. (a)What is the relation between function and recursion?
(b)Write a program to find C(n,r) and explain.

24. (a) Write a note on type styles and type sizes available in $LaTeX$.
(b) Create a $LaTeX$ source file to produce the following output.

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25. (a) Write the $LaTeX$ code to produce the following output.

Compare the set of equations

$$\cos^2 x + sin^2 x = 1 \qquad \text{and} \qquad \cosh^2 x - \sinh^2 x = 1$$
$$\cos^2 x - \sin^2 x = \cos 2x \qquad\qquad \cosh^2 x + \sinh^2 x = \cosh 2x$$

(b) Write the $LaTeX$ code to produce the following output.

Euler not only proved that the series $\sum_{n=1}^{\infty} \frac{1}{n^2}$ converges, but also that

$$\sum_{n=1}^{\infty} \frac{1}{n^2} = \frac{\pi^2}{6}$$

(c) Write the $LaTeX$ code to produce the following output.

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$$\left.\begin{aligned} u_x &= v_y \\ u_y &= -v_x \end{aligned}\right\} \quad \text{Cauchy-Riemann Equations}$$

(2×15=30)