24001063

QP CODE: 24001063

Reg No : .....

Name : .....

B.Sc DEGREE (CBCS) REGULAR / REAPPEARANCE EXAMINATIONS, MARCH 2024

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

7987E2B4

Time: 3 Hours Max. Marks : 80

Part A

*Answer any **ten** questions.*

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

1. What is the extension of Python file?
2. What are the purpose of the operators '//' and '%' in Python.
3. Comment the difference between the operators '=' and'==' in Python.
4. What do you mean by global variable in Python? Give example.
5. Using recursion function, write code for multiplication of two numbers.
6. What do you mean by empty dictionary. Give an example program.
7. What do you mean by slicing a list in Python?
8. What are the two modes used to open a Python file?
9. Write commands to produce the special symbols \ and &.
10. What are the commands used to create additional entries in the table of contents?
11. Write the output of the $LaTeX$ code

```
\begin {tabular} {|l|c|}
\hline
Name & Marks\\ \hline
Abhilash & 90\\
Arun & 85\\ \hline
\end{tabular}
```

12. Write the $LaTeX$ code for typeset $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

(10×2=20)

Part B

*Answer any **six** questions.*

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

13. Write a Python program to print the result of 5+3*2 then modified it to get a result as 16.

14. Explain the difference between finite loop and infinite loop in Python with example.

15. Write a Python program to display

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

16. Write a program to check whether the a number is "Amstrong or not".(Use len())

17. Explain in detail the truth table of 'and' , 'or' and 'not' in Boolean expression with Python.

18. Write a Python program to display the letters of a given string.

19. Create a sample Title page which contains Title, Name and address of two authors and date in $LaTeX$. Explain the commands used.

20. Write a note on the 'enumerate' environment.

21. Write a note on **figure** environment in $LaTeX$.

(6×5=30)

Part C

*Answer any **two** questions.*

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

22. Write syntax of for loop and while loop.
    Write Python program to print factorial of n using both loops.

23. Write a Python program which defines three functions to calculate the area of a rectangle, square and circle respectively. Program should calculate the area based on the user choice.

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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The Director
The $T_EX$nical Institute

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

The system of equations

$$x + y - z = 1$$
$$x - y + z = 1$$
$$x + y + z = 1$$

can be written in the matrix form as

$$\begin{pmatrix} 1 & 1 & -1 \\ 1 & -1 & 1 \\ 1 & 1 & 1 \end{pmatrix} \begin{pmatrix} x \\ y \\ z \end{pmatrix} = \begin{pmatrix} 1 \\ 1 \\ 1 \end{pmatrix}$$

Here, the matrix $\begin{pmatrix} 1 & 1 & -1 \\ 1 & -1 & 1 \\ 1 & 1 & 1 \end{pmatrix}$ is invertible.

(b) Write the output of the following $LaTeX$ code.

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

(2×15=30)