C 5670 (Pages : 3) Name.....

Reg. No.....

SECOND SEMESTER B.Sc. DEGREE EXAMINATION, MAY 2010

(CCSS Programme)

Mathematics—Core Course

MM 2B 02—INFORMATICS AND MATHEMATICAL SOFTWARE

Time : Three Hours Maximum Weightage : 30

I (Objective Type Questions)

Answer **all** *twelve questions.*
Each bunch of **four** *questions carries* 1 *credit.*

1. What is a mainframe computer ?
2. How complex numbers are defined in Python ?
3. How will you represent a string constant in Python ?
4. What is the Latex statement for the symbol $\sum$?

(4 × ¼ = 1 credit)

5. Which are the optical storage devices used in computers ?
6. What is the use of *pass* statement in Python ?
7. How random numbers are generated in Python ?
8. Which are the characters in Latex used only in Mathematical formulas ?

(4 × ¼ = 1 credit)

9. Which type of monitor is most commonly used with portable computers ?
10. What is the use of *dir* ( ) function in Python ?
11. How will you concatenate two strings in Python ?
12. What is Latex command for obtaining double line spacing ?

(4 × ¼ = 1 credit)

II (Short Answer Type Questions)

Answer **all** *nine questions.*
Each question carries 1 *credit.*

13. What is the difference between multi-user and multi-tasking operating systems ?
14. Explain how a list is used as a queue in Python.
15. Describe the *while* statement with an example.
16. Write a Python program to print the squares of the first 10 natural numbers with the numbers right justified in their fields.

Turn over

17. What is the output of the following statements ?

```
a = [4.5, 69, -789, 0, 441]
a.insert(3, 1000)
a.append(589)
a.sort()
print a
```

18. Write Latex statements to create the matrix $\begin{bmatrix} 1.1 & -2.3 & 3.4 \\ -5.6 & 6.7 & -8.9 \end{bmatrix}$.

19. What are the various output formats possible with Latex ?

20. Write the Latex statement for the function $f(x) = 2x^2 - 5xy + 3y^2 + 8x + 7y - 6$.

21. Write the Latex code for the equation, $u = \dfrac{x+y}{1+\dfrac{y}{z+1}}$.

(9 × 1 = 9 credits)

III (Short Essay Questions)

Answer any **five** *questions .*
Each question carries 2 *credits.*

22. What is an embedded operating system ? Where are they used ?
23. How exceptions are handled in Python ?
24. Write a module to print the Fibonacci series up to a number.
25. Write a Python program to determine whether an integer is perfect or not.
26. What is the output of the following Latex statements ?

```
\begin{tabular}{| |1|r | c| |}
\hline\hline
Sr. No. & Name & Marks\\\hline\hline
204 & ABC & 87.5\\\hline
205 & XYZ & 78 \\
\hline\hline
\end{tabular}.
```

27. Write the Latex statements to create the function $|x| = \begin{cases} -x, \text{if } x < 0 \\ 0, \text{if } x = 0 \\ x, \text{if } x > 0 \end{cases}$

28. What are the important document classes available in Latex ?

(5 × 2 = 10 credits)

IV (Essay Questions)

Answer any **two** *questions.*
Each question carries 4 *credits.*

29. Write a Python program to find the sum of first n Prime numbers.

30. Write a Python program to evaluate $\sin(x) = x\frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \ldots$

31. Prepare a sample index using Latex.

(2 × 4 = 8 credits)