

SECOND SEMESTER B.Sc. DEGREE EXAMINATION, MAY 2014

(UG-CCSS)

Core Course—Mathematics

MM2B02—INFORMATICS AND MATHEMATICAL SOFTWARES

(2010 Admission onwards)

Time : Three Hours

Maximum 30 Weightage

Part I*Answer **all** questions.*

A group of _____ bits is called a byte.

2 The statement used to terminate a loop is _____

Errors detected during execution are called _____

4. Write the output

```
from numpy import *
a = array ([2,3], [4, 5])
b = array ([1, 2], [3, 0])
print a + b.
```

5. Write the output

```
from pylab import *
a = polyl ([3, 4, 5])
print a • deriv )
```

6. The solution of the non-homogeneous matrix equation $Ax = \mathbf{b}$ is given by _____7. In bisection method, the number of bisections required to reach a prescribed limit is given by $n =$

8. From pylab import *

```
th = linspace (0, 2 * pi, 100)
r = 5 * ones (100)
polar (th, r)
show ( )
```

What is the output of the statement ?

Turn over

9. Output of the command `\sin x + \arctung` is _____
10. Write the Latex command for $\ln^4 + y^4$.
11. Write the Latex command for $\int_1^2 x^2 dx$.
12. Typeset $x = \frac{y+z/2}{y^2+1}$.

(12 x 1/4 = 3 weightage)

Part II

Answer all nine questions.

13. Write any two features of high level languages.
14.

```
>>> s = 'differential'
>>> t='equation'
>>> z*(s + t)
```

What is the output ?

15. Write a program to convert temperature in Fahrenheit to temperature in Celsius.

16. Write a program to demonstrate the cross product of two vectors.

17. Write a function to print Fibonacci numbers upto n.

18. Explain the append () and insert () functions for manipulating strings.

19. Write a program to draw a Pie chart for the following data :

Labels	...	A
Percentage	...	15 35 20 30

20. Explain the Newton-Rapson method of finding a root of $f(x) = 0$.
21. Type set $\sum_{i=1}^n x_i = \int_0^1 f$

(9 x 1 = 9 weightage)

Part III

Answer any five questions.

22. Write a Python program to print multiplication table of 7.
23. Define a string, $s = \text{mary had a little lamb}$? Write a program to print it in reverse order.
24. Write a program to solve

$$x + 2y + 2z = 11$$

$$3x - y + z = 4$$

$$4x + 2y - 3z = -1$$

25. Write a program to evaluate $\sin(x) = x - \frac{x^3}{3!} + \frac{x^5}{5!}$
26. Write a program to find a root of $f(x) = 5x^2 + 3x - 6 = 0$ using Newton-Raphson method.
27. Use matplotlib to write a Python program to plot $x = a \cos t, y = a \sin t$.
28. Write a program to plot $x = a \cos(t); y = a \sin(t)$.

(5 x 2 = 10 weightage)

Part IV

Answer any two questions.

29. Write a Python program to find the GCD of two numbers.
30. Write a program to find a root of $f(x) = x^3 - 10x^2 + 5$ using bisection method.
31. Prepare a sample index using latex.

(2 x 4 = 8 weightage)