C62671 (Pages : 3) Name.....

Reg. No.....

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.*

1. A group of ———— bits is called a byte.
2. The statement used to terminate a loop is ————.
3. 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 $Ax = b$ 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 ?

9. Output of the command $ \ sin x + \ arctung $ is _____.

10. Write the Latex command for $\sqrt{n^4 + y^4}$.

11. Write the Latex command for $\int_1^2 x^2 \, dx$.

12. Typeset $x = \frac{y + z/2}{y^2 + 1}$.

(12 × ¼ = 3 we

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	B	C	D
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 × 1 = 9 w

Part III

Answer any **five** *questions.*

22. Write a Python program to print multiplication table of 7.

23. Define a string, s = 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 $\sin(x) = x - \frac{x^3}{3!} + \frac{x^5}{5!} \ldots\ldots$

26. Write a program to find a root of $f(x) = 5x^2 + 3x - 6 = 0$ using Newton-Raphson method.

27. Use matplotlib to a write a Python program to plot $x = a\cos^3 t$, $y = a\sin^3 t$.

28. Write a program to plot $x = a\cos^3(t)$; $y = a\sin^3(t)$.

(5 × 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 × 4 = 8 weightage)