

## SECOND SEMESTER B.Sc. DEGREE EXAMINATION, APRIL 2012

(CCSS)

Mathematics — Core Course

MM 2B 02—INFORMATICS AND MATHEMATICAL SOFTWARE

Time : Three Hours

Maximum : 30 Weightage

## Part I

*Answer all questions.*

1. A program text written in a high level language is often called \_\_\_\_\_

(a) Object Code.

(b) Source code.

(c) Algorithm.

(d) Machine code.

2. `a = _____ + 'world'``b = 'ha' + 3``print a[-1] + b[0]`

The output will be \_\_\_\_\_

(a) dh.

(b) hd.

(c) hw.

(d) hh.

3. `x = 3 + 4j``print x, type(x)`

What will be the output ?

4. Errors detected during execution are called \_\_\_\_\_

5. From `numpy import *``a = arrange (1.0, 2.0, 0.1)`

What will be the output ?

6. The statement `p = poly 1d ([3, 4, 7])` constructs the polynomial \_\_\_\_\_If there is a root of  $f(x) = 0$  between  $x_1$  and  $x_2$  then \_\_\_\_\_(a)  $f(x_1) \cdot f(x_2) < 0$ .(c)  $f(x_1) = f(x_2)$ (d)  $f(x_1) > f(x_2)$ 

8. The formula for Newton Raphson method is \_\_\_\_\_

9. From `pylab` import\*

`k = 6`

`x = linspace (0, pi, 100)`

`y = k*x`

`polar (x, y)`

`show 0`

What is the output ?

10. What is the output of the following command `$\alpha\beta\gamma\pi$` ?

11. Write the LATEX command for  $z = \sqrt[5]{x^a + y^3}$ .

12. Write the LATEX command for  $\int x^2 ax$ .

(12 = 3 weightage)

## Part II

*Answer all questions.*

13. Write any two features of high level languages.

14. Distinguish between Compiler and Interpreter.

15. What is meant by dynamic data typing ?

16. Explain slicing operation.

17. Write a function to find n!

18. Write the statement for finding inverse of a square matrix.

19. Explain Newton Raphson method for finding the roots.

20. Type set  $\sin^2 x + \cos^2 x = 1$ .

21. Write a Python program to create any array with element 10,000 and 1000. Use it to print the common logarithm of each number and get the output as an array:

(9 x 1 = 9 weightage)

## Part III (Short Answer Type Questions)

*Answer any five questions.*

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

23. Write a Python program to find area of a rectangle.

24. Write a Python program to evaluate sine series :

$$\sin x = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \dots$$

and to plot the curve.

25. Write a Python code using `pylab` to solve using matrices :

$$\begin{aligned} 4x + y - 2z &= 1 \\ 2x + 3y + 3z &= 9 \\ 6x + 2y - z &= 0 \end{aligned}$$

26. Use `MATPLOTLIB` to write a Python program to plot the curve  $x = a \cos t$ ,  $y = a \sin t$  with value of  $a = 1, 2, 3, 4$ .

27. What are the main document classes supported by LATEX ?

28. Explain the two ways of typesetting mathematical formulae.

(5 x 2 = 10 weightage)

#### Part IV (Essay Type Questions)

*Answer any two questions.*

29. Write a program that will put words in alphabetical order.

30. Write a program to evaluate  $\sqrt{5}$  numerically using bisection method.

31. Write a Latex code to generate the following question paper :

COLLEGE OF ECONOMICS

SECOND SEMESTER B.A. DEGREE EXAMINATION, JUNE 2010

*Mathematical Economics*

Time : 3 hrs.

Max. Marks = 40

1. What are the different variables involved in a production function ?
2. Given  $Q = AK^\alpha L^\beta$ , find out marginal productivity of capital and labour.
3. Find output on the basis of input multiplier (A) and final demand (F)

$$A = \begin{pmatrix} 0.3 & 0.1 & 0.4 \\ 0.2 & 0.5 & 0.2 \\ 0.1 & 0.3 & 0.2 \end{pmatrix} \text{ and } F = \begin{pmatrix} 30 \\ 40 \\ 80 \end{pmatrix}$$

4 = 8 weightage)