

SECOND SEMESTER B.Sc. DEGREE EXAMINATION, APRIL 2012

(CCSS)

Mathematics — Core Course

MM 2B 02—INFORMATICS AND MATHEMATICAL SOFTWARE

Three Hours

Maximum : 30 Weightage

Part I

Answer all questions.

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

- (a) Object Code.
- (b) Source code.
- (c) Algorithm.
- (d) Machine code.

a = 'helo' + 'world'

b = 'ha' + 3

print a[-1] + b[0]

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

- (a) dh.
- (b) hd.
- (c) hw.
- (d) hh.

x = 3 + 4j

print x, type (x)

What will be the output ?

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

From numpy import\*

a = arrange (1.0, 2.0, 0.1)

What will be the output ?

The statement p = poly 1d ([3, 4, 7]) constructs the polynomial \_\_\_\_\_.

If there is a root of f(x) = 0 between x<sub>1</sub> and x<sub>2</sub> then \_\_\_\_\_.

- (a) f(x<sub>1</sub>).f(x<sub>2</sub>) < 0.
- (b) f(x<sub>1</sub>).f(x<sub>2</sub>) > 0.
- (c) f(x<sub>1</sub>) = f(x<sub>2</sub>).
- (d) f(x<sub>1</sub>) > f(x<sub>2</sub>).

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

Turn over

9. From pylab import\*

k = 6

x = linspace (0, pi, 100)

y = k\*x

polar (x, y)

show ()

What is the output ?

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

11. Write the LATEX command for  $z = \sqrt[5]{x^2 + y^3}$ .

12. Write the LATEX command for  $\int_1^2 x^2 dx$ .

(12 × ¼ = 3 weight)

### 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 common logarithm of each number and get the output as an array.

(9 × 1 = 9 weight)

### 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 :

$$\sin x = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \dots \text{ and to plot the curve.}$$



6. Write a Python code using pylab to solve using matrices :

$$4x + y - 2z = 0$$

$$2x - 3y + 3z = 9$$

$$6x + 2y - z = 0$$

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

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

8. Explain the two ways of typesetting mathematical formulae.

(5 × 2 = 10 weightage)

#### Part IV (Essay Type Questions)

Answer any two questions.

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

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

11. 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)

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

(2 × 4 = 8 weightage)