NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF APPLIED SCIENCE

COMPUTER SCIENCE DEPARTMENT AUGUST SUPPLEMENTS EXAMINATIONS 2004

SUBJECT: OBJECT ORIENTED SOFTWARE CONCEPTS AND DEVELOPMENT

[JAVA]

CODE: SCS4102

INSTRUCTION TO CANDIDATES

Answer any 5 questions Write all code in Java

3 HOURS

QUESTION ONE

Write a class which implements a square matrix of floats. Include the following methods:

- (a) input, to accept as input a matrix of up to 50 x 50 in size.
- [8]
- (b) transpose, to return the transpose of the current matrix.(c) add, to return the sum of two matrices.
- [2]

(d) multiply, to return the product of two matrices.

[8]

QUESTION TWO

Define the following terms:

(i)	IOException		[2]
(ii)	Object		[2]
(iii)	this		[2]
(iv)	public		[2]
(v)	int		[2]
(vi)	extends		[2]
(vii)	implements		[2]
(viii)	final		[2]
(ix)	float	,	[2]
(x)	void		[2]

QUESTION THREE

Design and implement a Swing application which plays the role of a simple calculator.

[20]

QUESTION FOUR

Implement a shape hierarchy of classes. Each class should be capable of:

(a) reporting its name;

[3]

(b) accepting data pertaining to its area; and

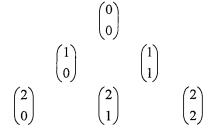
[5]

(c) calculating and reporting its area.

[12]

QUESTION FIVE

Write a program which accepts an integer as input and produces that many lines of pascal's triangle as output. The triangle has the following form:



[20]

QUESTION SIX

Write a class that accepts up to 50 numbers into a vector. The class should include methods to perform the following operations

(a) Determine the largest number in the vector and output it.

[5]

(b) Determine the second largest number in the vector and output it.

[5]

- (c) Determine the sum of the numbers in the vector and output it. $sum = \sum_{i=0}^{n-1} x_i$ [5]
- (d) Determine the mean of the numbers in the vector and output it. $\bar{x} = \frac{1}{n} \sum_{i=0}^{n-1} x_i$ [5]

QUESTION SEVEN

Explain the model-view-controller concept as used in swing, with respect to the JTextField object [2]

[20]



GOOD TACK!