



Department of Electronic and Computer Engineering

B142L Introduction to Computing

Semester 2 Examination

1.5 hours

Instructions:	Write your student ID number clearly on page 2. Write your answers to all 10 questions within the spaces provided in this examination paper. Handwritten notes are permitted with this examination.
Additional Information:	This is an open book exam
Provided:	None
Calculators:	Casio FX 85 Series or Casio FX 83 Series
Examiners:	Mr C Nguyen
External Examiner:	Professor R Pethig

Student ID Number

QUESTION 1

- a) Place an "X" in the box next to **3 terms** that are most directly related to the use of **arrays** in a C program. **[3 Marks]**

<input type="checkbox"/>	first
<input type="checkbox"/>	length
<input type="checkbox"/>	element
<input type="checkbox"/>	default
<input type="checkbox"/>	head

<input type="checkbox"/>	main
<input type="checkbox"/>	range
<input type="checkbox"/>	index
<input type="checkbox"/>	shift
<input type="checkbox"/>	tail

- b) Write a C program to collect the ticket prices at 50 movie theatres, store them in an array and display the average ticket price. Show or use all the terms selected in part (a).

[7 Marks]

QUESTION 2

Modify the following source code to correct all errors. Line numbers have been provided for reference. Indicate specific line numbers in your answers when necessary. **[10 Marks]**

```
01: #define COORDINATES = 10
02:
03: int main( void )
04: {
05:     int x = 10;
06:     int y = 0;
07:
08:     printf( "The following are %s coordinates on the line, y = 4x
+ 5",
09:           COORDINATES );
10:
11:     do
12:     {
13:         printf( "\n x = d, y = d", x, (4x ) + 5 );
14:         x = y;
15:     } while( x < COORDINATES )
16: }
```

QUESTION 3

Consider the following source code. Line numbers have been provided for reference. Indicate specific line numbers in your answers when necessary.

```
01: #include <string.h>
02:
03: int count_letters_z( char* );
04:
05: int main( void )
06: {
07:     char input[ 64 ] = { '\0' };
08:
09:     scanf( "%s", input );
10: }
```

- a) Modify the source code to **define the count_letters_z() function which returns the number of 'z' characters found in the input word**. For example, the function would return a value of 1 for the input string "zero". **[8 Marks]**

- b) Modify the source code to **use the count_letters_z() and display the return value to output**. **[2 Marks]**

QUESTION 4

- a) Place an "X" in the box next to **3 terms** that are most directly related to **selection and decisions** in the C language. [3 Marks]

<input type="checkbox"/>	local
<input type="checkbox"/>	else
<input type="checkbox"/>	loop
<input type="checkbox"/>	if
<input type="checkbox"/>	or

<input type="checkbox"/>	sprintf
<input type="checkbox"/>	return
<input type="checkbox"/>	stdout
<input type="checkbox"/>	stderr
<input type="checkbox"/>	stdin

- b) Write a C program to **ask for an input number until the input matches one of the secret numbers. Display a message to inform the user when the input does not match. The secret numbers are 45 and 47.** Show or use all the terms selected in part (a). [7 Marks]

QUESTION 5

Consider the following source code. Line numbers have been provided for reference. Indicate specific line numbers in your answers when necessary.

```
01: #include <string.h>
02:
03: int main( void )
04: {
05:     char input[ 25 ] = { '\0' };
06:     int counter = 0;
07:
08:     scanf( "%s", input );
09:
10:     do
11:     {
12:         if ( input[ counter ] == 's' )
13:             break;
14:
15:         printf( "%s\n", input );
16:
17:         counter = counter + 6 / 2;
18:     } while ( counter < strlen( input ) );
19: }
```

a) List the program output when the **input value is the string "course"**. [3 Marks]

b) Describe input values that would produce **longest output display**. [7 Marks]

QUESTION 6

Consider the following source code. Line numbers have been provided for reference. Indicate specific line numbers in your answers when necessary.

```
01: int main( void )
02: {
03:     int total_cookies = 40;
04:     int order_quantity;
05: }
```

- a) Modify the source code to **accept the order quantity as an input value and display the total cost of the order when the price is £0.15 per cookie.** [4 Marks]

- b) Modify the source code to **display an error message when the order quantity is less than 1 or more than the total available cookies.** [6 Marks]

QUESTION 7

a) Place an "X" in the box next to **3 terms** that are most directly related to the use of **iterative loops** in a C program. **[3 Marks]**

<input type="checkbox"/>	initialization
<input type="checkbox"/>	assignment
<input type="checkbox"/>	declaration
<input type="checkbox"/>	selection
<input type="checkbox"/>	global

<input type="checkbox"/>	format
<input type="checkbox"/>	input
<input type="checkbox"/>	void
<input type="checkbox"/>	body
<input type="checkbox"/>	for

b) Write a C program to **display all integer numbers between 55 and 500** (inclusive) **which are divisible by 4**. Show or use all the terms selected in part (a). **[7 Marks]**

QUESTION 8

Modify the following source code to correct all errors. The program is intended to **continue asking for an input string until the input string is at least 4 characters in length and the first letter is upper case.** Line numbers have been provided for reference. Indicate specific line numbers in your answers when necessary. **[10 Marks]**

```
01: #define <string.h>
02: #define <ctype.h>
03:
04: int main( void )
05: {
06:     string word[ 64 ] = { '\0' };
07:     int finish = 64;
08:
09:     do
10:     {
11:         scanf( "%lf", word );
12:
13:         if ( strlen( word ) >= 64 )
14:         {
15:             if ( isupper( word[ 0 ] ) )
16:                 finish = 1;
17:         }
18:     } while ( ! finish )
19: }
```

QUESTION 9

Write a C program that **uses an array to store 15 numbers provided below**. The program **must continue asking for an input number until the guess matches one of the numbers stored in the array**. [10 Marks]

3, 5, 6, 8, 11, 12, 16, 17, 18, 23, 24, 29, 30, 31, 37



QUESTION 10

a) Place an "X" in the box next to **3 terms** that are **basic data types** in the C language.

[3 Marks]

<input type="checkbox"/>	variable
<input type="checkbox"/>	integer
<input type="checkbox"/>	string
<input type="checkbox"/>	array
<input type="checkbox"/>	real

<input type="checkbox"/>	imaginary
<input type="checkbox"/>	character
<input type="checkbox"/>	complex
<input type="checkbox"/>	double
<input type="checkbox"/>	static

b) Write a C program to **calculate and display the average price of the mobile phones provided below**. Show or use all the terms selected in part (a).

[7 Marks]

Nokia 5800	£64.99
Sony Ericsson C510	£89.99
Samsung Jet	£124.95
Nokia N97	£199.99