



Family Name	
Given Names	
Student Number	
Teaching Period	Semester 1, 2017

FINAL EXAMINATION	DURATION				
HIT365 – C Programming	<table border="1"> <tr> <td>Reading Time:</td> <td>10 minutes</td> </tr> <tr> <td>Writing Time:</td> <td>180 minutes</td> </tr> </table>	Reading Time:	10 minutes	Writing Time:	180 minutes
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INSTRUCTIONS TO CANDIDATES

EXAM CONDITIONS

You may begin writing from the commencement of the examination session. The reading time indicated above is provided as a guide only.

This is a CLOSED BOOK examination

No calculators are permitted

No handwritten notes are permitted

No dictionaries are permitted

ADDITIONAL AUTHORISED MATERIALS	EXAMINATION MATERIALS TO BE SUPPLIED
No additional printed material is permitted	1 x 20 Page Book

**THIS EXAMINATION IS PRINTED
DOUBLE-SIDED.**

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Question 1

- (a) Discuss the differences between a directed graph and an undirected graph.
- (b) In most cases, a **for** statement in a c program can be represented with an equivalent **while** statement. However, there is one exception. Discuss this exception.
- (c) Describe the technique to generate a different sequence of random numbers each time the program runs.

(9 marks)

Question 2

Write a program that utilises looping to produce the following table of values:

N	N-3	N+3	N*3
9	6	12	27
18	15	21	54
27	24	30	81
36	33	39	108
45	42	48	135

(6 marks)

Question 3

Assume that array **int v[5]** has been defined and its first element is at location 3000 in memory.

- (a) How to initialise a pointer variable **vPtr** to point to **v[0]**?
- (b) What is the memory address that the pointer **vPtr** points to after executing the following statement **vPtr += 3**? Assume that an integer is stored in 4 bytes of memory.

(4 marks)

Question 4

What will the output be when you execute the following c code?

```
#include<stdio.h>
int main(){
    const int *p;
    int a=10;
    p=&a;
    printf("%d",*p);
    return 0;
}
```

(4 marks)

Question 5

Write a c program that contains a function **stringConcat** to concatenate two strings without using string functions of the standard library.

(7 marks)

Question 6

What will the output be of following program? Assume that the memory addresses for **i**, **j** and **k** are 1000, 2000 and 3000 respectively.

```
#include<stdio.h>
int main(){
    int i = 3;
    int *j;
    int **k;
    j=&i;
    k=&j;
    printf("%u %u %d ",k,*k,**k);
    return 0;
}
```

(5 marks)

Question 7

Create a structure with members **int a**, **int b** and **float c**. Write a program that demonstrates how a structure variable **value1** can be assigned to another structure variable **value2**. Print the value assigned to the structure variable **value2**.

(5 marks)

Question 8

Write a program to create a structure **student**, which contains **name**, **roll** and **marks** as its data member. Then, the program creates a structure variable **s**. Then, data **name**, **roll** and **marks** is taken from the user and stored in data members of structure variable **s**. Finally, the data entered by the user is displayed.

(6 marks)

Question 9

What is the output of the following program?

```
#include <stdio.h>
#include <ctype.h>

void convert ( char *sPtr );

int main( void )
{
    char string[] = "characters and $32.98";

    printf( "The string before is: %s", string );
    convert( string );
    printf( "\nThe string after is: %s\n", string );
}

void convert( char *sPtr )
{
    sPtr+=10;
    while ( *sPtr != '\0' ) {
        *sPtr = toupper( *sPtr );
        ++sPtr;
    }
}
```

(4 marks)