UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER I
SESSION 2015/2016

COURSE NAME	:	COMPUTER PROGRAMMING
COURSE CODE	:	DAE 20102
PROGRAMME	:	2 DAE
EXAMINATION DATE	:	DECEMBER 2015/ JANUARY 2016
DURATION	:	2 HOURS
INSTRUCTION	:	ANSWER **FIVE (5)** QUESTIONS ONLY

THIS QUESTION PAPER CONSISTS OF **SEVEN (7)** PAGES

Q1 (a) Define '*algorithm*'.

(2 marks)

(b) Flowchart can be used to design and represent algorithm. Draw the flow chart for the pseudo code below:

Start
Read the value of first integer,x
Read the value of second integer,y
Calculate the total value, z as first integer multiply by second integer
Display the total value
End

(10 marks)

(c) Identifier is a special symbol for naming the entity/element as variable, constant and function for a program. Give **three (3)** rules for naming the identifier.

(3 marks)

(d) Determine whether the following identifiers is valid or invalid.

(i)   Two&One
(ii) double
(iii) Twenty2
(iv) _U_turn
(v) break

(5 marks)

Q2 (a) A program asks the user to enter two numbers, obtains the two numbers from the user, and calculate the sum, product, difference, quotient and modulus of that two numbers. Write C statement for:

(i)   Identifier 'X' and 'Y' as integer value declaration
(ii) Prompt user to enter two numbers

(5 marks)

(b)   Show the operation for

   (i)   Sum
   (ii)   Product
   (iii) Difference
   (iv)   Quotient
   (v)   Modulus

(5 marks)

(c)   Given the value of a = 85, b = 10, c = 6, d = 12, determine the output from the following program segment using operator priority.

   (i)   ans = a / b % c * d – b % (d – 1)
   (ii)   ans = a + d / (c * d);
   (iii) ans = d + b / c;
   (iv)   ans = (c * d) % a;
   (v)   ans = a + b + c + d;

(5 marks)

(d)   (i)   Define the types of programming errors.
        (ii)   Briefly described each of them.

(5 marks)

Q3   (a)   Show the output for the following program segment:

```
for (i=1; i<=3; i++)
{
        for (j=1;j<=3;j++)
        {
                for (k=1;k<=4;k++)
                        printf("*");
                printf("\n");
        }
        printf("\n");
}
```

(6 marks)

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(b) Modify the following code to produce the output shown. Use proper indentation techniques. You may not make any changes other than inserting braces. The compiler ignores the indentation in a C program. Note: It is possible that no modification is necessary.

```
if (y == 8)
if (x == 5)
printf("@@@@@\n");
else
printf("#####\n");
printf("$$$$$\n");
printf("&&&&&\n");
```

(i) Assuming **x = 5** and **y = 8**, the following output is produced.

```
@@@@@
$$$$$
&&&&&
```

(ii) Assuming **x = 5** and **y = 8**, the following output is produced.

```
@@@@@
```

(iii) Assuming **x = 5** and **y = 8**, the following output is produced.

```
@@@@@
&&&&&
```

(iv) Assuming **x = 5** and **y = 7**, the following output is produced. Note: The last three **printf** statements are all part of a compound statement.

```
#####
$$$$$
&&&&&
```

(4 marks)

(c) Write the following nested '*if*' statement as a '*switch*' statement:

```
if (n = = 1)
     printf("A");
else if ((n == 2) || (n == 3))
     printf("B");
else
     printf("C");
```

(5 marks)

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(d)   Write the following '*for*' statement as '*while*' statement.

```
for (z = 0; z < 5; z++) {
        printf("Insert total sell");
        scanf("%f", & total);
        total += total;
        }
```

(5 marks)

Q4   (a)   Give the function header for each of the following functions.

   (i)   Function **add_number** that takes **two (2)** double-precision floating point arguments, **num1** and **num2**, and returns a double-precision floating point result.
   (ii)   Function **biggest** that takes **three (3)** integers **a,b,c**, and returns an integer.
   (iii)   Function **Instructions** that does not receive any arguments and does not return a value. (Note: Such functions are commonly used to display instructions to a user).
   (iv)   Function **intToFloat** that takes an integer argument, **number**, and returns a floating point result.

(8 marks)

(b)   Write a function that displays at the left margin of the screen a solid square of asterisk whose side is specified in integer parameter **side**. For example, if **side** is **3**, the function displays

```
***
***
***
```

(12 marks)

Q5   (a)   Consider a 2-by-5 integer array **Z**.

   (i)   Write a declaration for **Z**.
   (ii)   State, how many rows does **Z** have.
   (iii)   State, how many columns does **Z** have.
   (iv)   State, how many elements does **Z** have.
   (v)   Write the names of all elements in the second row of **Z**.
   (vi)   Write the names of all the elements in the third column of **Z**.

(6 marks)

(b) Trace the display output for the following fragment code:

```
int listA[]={8,9,10};
int listB[]={1,2,3};

    for (int i=2; i >= 0; i--){

        printf("%d:",listB[i]);
        printf("%d\n",listA[i]*listB[i]);

}
```

(6 marks)

(c) Write C segments which print the values of each element of array **table**. Assume the array was initializes with the declaration,

int table [3][3] = {{1, 8}, {2, 4, 6}, {5}};

and the integer variables **x** and **y** are declared as control variables. Show the output.

(8 marks)

Q6 (a) Draw the graphical representation of a pointer in memory based on the following segment code:

```
int s = 10;
int t = 2;
xPtr = & s;
yPtr = & t;
*yPtr = s * t;
```

(4 marks)

(b) For each of the following, write a single statement.

(i) Declare the variable **fPtr** to be a pointer to an object of type **float**.
(ii) Assign the address of variables **number1** to pointer variable **fPtr**.
(iii) Write the function header for a function called **exchange** that takes two pointers to floating point number **x** and **y** as parameters, and does not return a value.
(iv) Write the function prototype for the function in **Q6(b)(iii)**.

(4 marks)

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(c) Write C statement to do the following:

(i)   Define a structure called worker which consist of **three (3)** data members: Department, number of technician and number of engineer.

(ii) Declare the **shiftA** as variable of type **worker**.

(iii) Assign the following values for specific data members:

Department : TEST
Number of technician : 30
Number of engineer : 3

(iv) Display all the details about **shiftA**. Your running program should at least meet the following output:

```
    Shift A
    **********************************
    Department : TEST
    Number of technician : 30
    Number of engineer : 3
```

(10 marks)

(d) There are **two (2)** communication ports that been use in C applications. State both of them.

(2 marks)

- END OF QUESTION -