Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2017/2018

COURSE NAME	:	PRINCIPLES OF PROGRAMMING
COURSE CODE	:	DAT 10603
PROGRAMME CODE	:	DAT
EXAMINATION DATE	:	JUNE / JULY 2018
DURATION	:	3 HOURS
INSTRUCTION	:	ANSWER ALL QUESTIONS IN THE ANSWER BOOKLET

THIS QUESTION PAPER CONSISTS OF **EIGHT (8)** PAGES

PART A

Q1 Which of the following program translates the source code into machine code?

A. Linker
B. Compiler
C. Operating System
D. Editor

Q2 Which of the following is **TRUE** about variables in C?

i. Variables are memory cells used to store a program's data.
ii. lMalaysia is a valid variable name.
iii. NUM and num are considered as two different variables.
iv. Variables must be declared before they can be used.

A. i, ii and iii.
B. i, iii and iv.
C. ii, iii and iv.
D. All of the above.

Q3 What is the value of variable x after the following program segment is executed?

```
int x = 0;
float m = 3.2;
double n = 3.0;
x = 15 - m * n;
```

A. 5
B. 5.4
C. 6
D. 35.4

Q4 Which of the following is **NOT** a logical operator in C?

A. &&
B. ||
C. !
D. %

Q5 The _____ statement is used to determine the student letter grades ('A', 'B', 'C or 'D') based on his/her total marks.

A. one way if
B. two way if
C. multiway if
D. nested if

Q6 Which of the following statements is **FALSE** about loop?

A. It is possible that the statements in a `while` loop are never executed.
B. A loop that continues to execute endlessly is called an infinite loop.
C. It is an error to use the `for` statement in a `while` loop.
D. A pre-test loop tests for a condition prior to execute a loop body

Q7 Which of the following is **TRUE** about an array?

A. An array is a collection of different types of data.
B. The first element of an array A is `A[1]`.
C. The last element of an array A of size n is `A[n]`.
D. The index value specifies the position of the element in the array.

Q8 The statement which can be used to declare a character based array called `str` of six elements is _____.

A. `char str[6];`
B. `string str;`
C. `char str[5];`
D. `string str[6];`

Q9 Which of the following is **FALSE** about function?

A. `char str[6];` The formal parameters listed in a function header, must include each parameter's data type and name.
B. `string str;` The names of the formal parameters in the function header must be the same to the names of the actual arguments in the function call.
C. The sequence of parameters in the function call and parameters in the function header must be the same.
D. The function call of a void function should be a statement by itself, while the return function must be written in other statement.

Q10 The function prototype for function `Example()` is as given below:

```
void Example(int x,int y,float z);
```

Which of the following function call is **VALID**?

A. `Example(int x,int y,float z);`
B. `Example(x, y, z);`
C. `A = Example(int x,int y,float z);`
D. `A = Example(x, y, z);`

(10 marks)

PART B

Q11 Given the following statements:

(a) `for(i = 0; i < 3; i++);`

(b) `div = n/0;`

(c) `printf("%d", x + y)`

For each statement:

(i) Identify the type of error.

(ii) Explain why the error happen.

(iii) Write the correct statement.

(9 marks)

Q12 Convert the following mathematical formula to arithmetic expression in C.

(a) $P = a + b + \sqrt{a^2 + b^2}$

(b) $A = \sqrt{s(s-a)(s-b)(s-c)}$

(c) $V = \frac{4}{3}\pi r^3$

(3 marks)

Q13 Write an appropriate declaration for each of the following:

(a) A variable to store age of patient.

(b) A variable that stores name of participant.

(c) A variable to store total price that customer has to pay.

(3 marks)

Q14 Variable x is declared as `int x = 2945;`

Calculate the value of each of the following expressions:

(a) `(x / 100) % 10`

(b) `x % 10`

(c) `(x / 10) % 10`

(3 marks)

Q15 Determine whether the following Boolean expression is **TRUE** or **FALSE**. Given `w = 2, x = - 4, y = 2, z = 300`. Show your work.

(a) `y > x && y > z`

(b) `y == w && z < x`

(c) `z > 100 || w != y`

(d) `y * 200 < z`

(8 marks)

Q16 The parking rate at an airport is as follows:

Duration (hour)	Parking Rate Per Hour (RM)
First three	4
Next six	3
Ten or above	2

Write a C program segment that calculate the parking charge based on hours parked.

(6 marks)

Q17 Given the following program segment:

```
int i = 0;
for(int x = 150; x != 0; x = x / 2)
      i++;
```

Identify whether the following program segments produce the **SAME** or **DIFFERENT** result as the above program segment.

(a)
```
int x = 150;
int i = 0;
while (x != 0)
{
      x = x / 2;
      i++;
}
```

(b)
```
int x = 150;
int i = 0;
do
{
      x = x / 2;
      i++;
}while (x != 0);
```

(c)
```
int x = 150;
for (int i = 0; i != 0; i++)
      x = x / 2;
```

(d)
```
int x = 150;
for (int i = 0; x != 0; i++)
      x = x / 2;
```

(8 marks)

Q18 Given the following program segment:

```
int i = 0,list_array[5];
while(i < 5)
{
      list_array[i] = 2 * i + 5;
      if(i % 2 == 0)
            list_array[i]- list_array[i] - 3;
      printf("%d ",list_array[i]);
      i = i + 1;
}
```

(a) Trace the program segment using a tracing table.

(7.5 marks)

(b) Write the output of the program segment.

(2.5 marks)

Q19 The score for 50 students are declared as follows:

```
float score[50];
```

Write a program segment to count the number of students that pass and fail. Passing score is 50 or above.

(5 marks)

Q20 Write the function definition for function `convertToGrams()` which receives a measurement in ounce as parameter, convert them to the equivalent gram and return the result of the conversion.

(1 pound = 16 ounces, 1 pound = 453.592 grams)

(5 marks)

PART C

Q21 Zakat is payment made by Muslims annually under Islamic law on certain kinds of property. Create a zakat calculator program that calculates and displays information about a Muslim's annual earning zakat. The program consists of the following functions:

(a) `float earning()`
- (i) Receive annual salary and total of other earnings.
- (ii) Calculate annual earnings using formula: annual salary + total of other earnings
- (iii)Return annual earnings.

(b) `float expenses()`
- (i) Receive number of wives (each wife is allocated RM3000 in expenses), number of children (each child is allocated RM1000 in expenses) and annual spending for parents, education and medical purposes.
- (ii) Calculate annual expenses using formula: self-support (default RM9000) + total expenses for wives + total expenses for children + annual spending for parents + annual spending for education + annual spending for medical purposes
- (iii)Return annual expenses.

(c) `float earningCounted()`
- (i) Receive annual earnings and annual expenses.
- (ii) Calculate total earnings considered for zakat using formula: annual earnings – annual expenses
- (iii)Return total earnings considered for zakat.

(d) `void zakatYearly()`
- (i) Calculate zakat that has to be paid for the year using formula: total earnings considered for zakat x 0.25%
- (ii) Display zakat that has to be paid for the year.

(e) `float zakatMonthly()`
- (i) Calculate zakat that has to be paid monthly using formula: zakat that has to be paid for the year / 12
- (ii) Return zakat that has to be paid monthly.

(f) `int main()`
- (i) Ask user to input annual salary, total of other earnings, number of wives (if the user is a male), number of children and annual spending for parents, education and medical purposes.
- (ii) Call function `earning()`, `expenses()`, `earningCounted()`, `zakatYearly()`, and `zakatMonthly()`.
- (iii)Display annual earnings, expenses, and earnings considered for zakat and monthly zakat payment thas has to be made.

Sample program output is as follows:

```
Yearly zakat calculator

Yearly Earnings Information
Total salary: RM 60000
Total of other earnings: RM 3500


Yearly Expenses Information
Self: RM 9000
Gender: (1-male,2-female): 1
Number of wives (0-4): 1
Number of children (0 if none): 1
Parents: RM 3600
Education: RM 2000
Medical: RM 200

Earnings: RM 63500.00
Expenses: RM 18800.00
Earnings considered for zakat: RM 44700.00
Zakat yearly: RM 1117.50
Zakat monthly: RM 93.13
```

(30 marks)

-END OF QUESTIONS-