UNIVERSITY OF GHANA

BACHELOR OF SCIENCE IN ENGINEERING
SECOND SEMESTER EXAMINATIONS, 2012/2013
FAEN 112 C PROGRAMMING (2 Credits)
Answer ALL Questions on the question paper provided

Time : **1½Hours** Date : 16 May, 2013

Index Number: _____ Signature: _____

1. Every statement in C must be terminated with a ... [1 mark]

   (i)

2. Write out the skeleton for a typical C Program. [1 mark]

3. Write a C program that asks for two integer values from the user. If the first value entered is divisible by the second, the program should print "#1 is divisible by #2" or otherwise "#1 is NOT divisible by #2" . Where #1 and #2 are the respective values entered. [3 marks]

4. In every C program, there must be at least one function. Name this function.

   (i) [1 mark]

Index Number: _____ Signature: _____

5. Write a **single** C statement to declare and initialize a variable that will hold the value of PI, π.

   (i) [1 mark]

6. Point out the error, if any, in the following C statements.

   (i) int = 314.562*150; [1 mark]

   (ii) name = 'Adwoa'; [1 mark]

   (iii) 3.14 * r * r = area [1 mark]

   (iv) k = a * b + c(2.5a+b); [1 mark]

7. Write a simple `for` loop that prints out the string "Hello" **n** times on the screen. Assume you are writing in the main function. [3 marks]

8. Write the syntax for the `switch, case` statement in C . [2 marks]

9. State which of the following variable names is **valid** or **not valid** and why?

   (i) FLOAT [1 mark]

(ii) _basic [1 mark]

(iii) basic-hra [1 mark]

(iv) over time [1 mark]

10. Re-write each of the following C statements in **another form**.

(i) $a = a * c;$ [1 mark]

(ii) $--i;$ [1 mark]

11. Write out **two pairs** of arithmetic operators that share the same level of precedence.

(i) [1 mark]

(ii) [1 mark]

12. What is the **output** of the code shown below. *Assume the code is in the main function.*

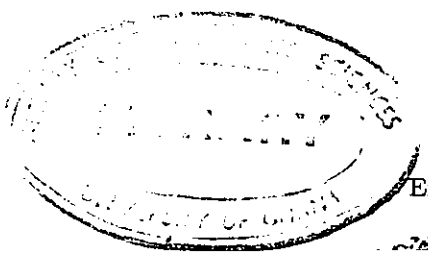
```
int answer, result;
answer = 100;
result = answer - 10;
printf ("The result is %i\n", result + 5);
```

(i) [1 mark]

13. Convert the following statements into corresponding C statements. *Assume all variables have been declared.*

(i) $Z = \dfrac{8.8(a+b)2/c - 0.5 + 2a/(q+r)}{(a+b) * (1/m)}$ [2 marks]

(ii) $X = \dfrac{-b + (b * b) + 24ac}{2a}$ [2 marks]



(iii) $R = \dfrac{2v + 6.22(c + d)}{g + v}$ [2 marks]

14. **Declare** an array that is intended to hold the heights of 20 students. Only declare.

(i) [1 mark]

15. Briefly explain the **break statement** and any two instances in which it is used. [3 marks]

_____

_____

_____

_____

16. Write out any three **logical operators** you know?

(i) [1 mark]

(ii) [1 mark]

(iii) [1 mark]

17. Identify the **syntactic errors** in the following program.Then write out the correct code. *Assume that this code is in the main function.* [4 marks]

```
INT sum;
sum = 25 + 37 - 19
printf ("The answer is %f\n" sum)
```

_____

_____

_____

18. Give the general **structure** or **format** of a do-while loop. [1 mark]

19. Name the **data type(s)** that are possible arguments to the switch statement. [2 marks]

(i)

(ii)

Index Number: _____ Signature: _____

20. Write a program that converts any value the user inputs through the console from degrees Fahrenheit (F) to degrees Celsius (C) using the following formula: $C = (F - 32)/1.8$.Print out the result in the format: e.g "33.1 Degree Fahrenheit is 1.8 Degree Celsius" .
Assume you are writing in the main function. [4 marks]

21. What is the **value** of the variables x and y respectively after the execution of the code below?

```
int x=4;
int y = x++ ;
```

(i) x= [1 mark]

(ii) y= [1 mark]

22. **Briefly** explain type casting. Write one C statement for **explicit** type casting. [2 marks]

_____

_____

_____

23. What is the **value of x** in the following operation : int x = (5 + 10 * 2 - 10)/2; [2 marks]

(i)

24. **Differentiate** between syntax error and runtime error. [2 marks]

_____

_____

_____

25. In **one sentence** explain the ASCII value of a character in C? [1 mark]

_____

26. Name **two** other header files apart from 'stdio.h' and name one function found in each.[4 marks]

(i) Header:
- Function:

(ii) Header:
- Function:

Index Number: _____ Signature: _____

27. How is the **continue** statement different from the **break** statement? **Briefly** explain. [2 marks]

28. Write a C statement to dynamically allocate space for an integer array of length 20.

    (i) [1 mark]

29. Supposing you had an array and wanted to use a function to populate it. What two arguments are you most likely to pass to the function?

    (i) [1 mark]

    (ii) [1 mark]

30. Distinguish between **call by value** and **call by reference** regarding functions in C. [3 marks]

31. If the value of an integer pointer "xptr" is 1000, what is the result of "xptr + 2" ? [1 mark]

    (i)

32. Given the structure below, write a statement to declare an array of 50 employees employing **dynamic memory allocation.** [1 mark]

```
struct employee
{

    char name[25] ;
    int age ;
    float salary ;
    float allowance;

} ;
```

33. State **one** advantage of dynamic memory allocation in programming . [1 mark]

Index Number: _____ Signature: _____

34. List two advantages of functions. [2 marks]

(i)

(ii)

35. Name the function used to **deallocate** memory. Why is deallocating memory necessary after dynamic memory allocation. [2 marks]

(i)

_____

_____

36. Every **function** in C is made up of **three parts**. Name them. [3 marks]

(i)

(ii)

(iii)

37. What is a recursive function? [1 mark]

_____

_____

38. With an example, **briefly** explain **User-Defined Types**, UDT. [2 marks]

_____

_____

39. **Briefly** explain the following terms

(i) local variable [1 mark]

_____

_____

_____

_____

(ii) global variable [1 mark]

_____

_____

_____

_____

40. Kwaku's basic salary is input through the keyboard. His TNT is 40% of basic salary, and house rent allowance is 20% of basic salary. Write a program to **calculate** and **output** his gross salary. [5 marks]