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(Knowledge for Development)

KIBABII UNIVERSITY

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UNIVERSITY EXAMINATIONS
2017/2018 ACADEMIC YEAR

END OF SEMESTER EXAMINATIONS
YEAR ONE SEMESTER ONE EXAMINATIONS

FOR THE DEGREE OF
BACHELORS OF SCIENCE
(INFORMATION TECHNOLOGY)

COURSE CODE : BIT 113

COURSE TITLE : FUNDAMENTALS OF PROGRAMMING

MAIN PAPER

DATE: 18/01/2018 **TIME: 9.00-11.00AM**

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTION ONE AND ANY OTHER TWO QUESTIONS

Question One [Compulsory] (30 Marks)

a. Define the following terms **[3 Marks]**
   i. Programming language
   ii. Module
   iii. Flowchart
b. Explain two differences between high level and low level languages. **[4 Marks]**
c. Using relevant examples, explain the use of scanf and printf functions. **[4 Marks]**
d. Distinguish between high level and very high level languages and name two examples of each. **[4 Marks]**
e. Explain any two advantages and two disadvantage of using flowcharts to design a program. **[8 Marks]**
f. Design a pseudocode for a program that prompts the user to input a number. Program should display the corresponding day to the number. For example if a user type 1 the output should be Sunday and if user type 7 the output should be Saturday. **[7 Marks]**

Question Two (20 Marks)

a. Using flowchart constructs, explain the differences between **if** and **if .. else** statements. **[6 Marks]**
b. Explain any two different ways of passing parameters to the functions. **[4 Marks]**
c. Write a C program that stores **n** integers in a one dimensional array where value of **n** is given by user. Your program should reverse the element of array. **[10 Marks]**

Question Three (20 Marks)

a. By using valid example, write down the syntax of a variable definition in C. **[2 Marks]**
b. i. Explain the difference between function definition and function declaration. **[2 Marks]**
c. Ii. Support your answer in (i) above by writing down the syntax of both function definition and function declaration. **[4 Marks]**
d. Explain any two advantages of user-defined functions. **[2 Marks]**
e. The roots of the quadratic equation $ax^2 + bx + c = 0$, are given by the following formula:

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

In this formula, the term $b^2 - 4ac$ is called the **discriminant**. If $b^2 - 4ac = 0$, then the equation has two equal roots. If $b^2 - 4ac > 0$, the equation has two real roots. If $b^2 - 4ac < 0$, the equation has two complex roots. Write a C program that prompts the user to input the value of **a** (the coefficient of x^2), **b** (the coefficient of x), and **c** (the constant term) and outputs the roots of the quadratic equation. **[10 Marks]**

Question Four (20 Marks)

a. Using a valid example, discuss the usage of a **switch** statement. **[4 Marks]**
b. Distinguish between identifiers and comments as used in programming. Use valid examples to support your answer. **[4 Marks]**
c. Explain why the use of **goto** statement is highly discouraged in any programming. **[2 Marks]**
d. Write a C program that prompts the user to input a positive integer. It should then output a message indicating whether the number is a prime number. A prime number is a number that is evenly divisible only by itself and 1. For example, the number 5 is prime because it

can be evenly divided only by 1 and 5. The number 6, however, is not prime because it can be divided evenly by 1, 2, 3, and 6. **[10 Marks]**

Question Five (20 Marks)

a. Compare and contrast between local and global variables. **[4 Marks]**

b. Distinguish between library and user-defined functions. **[2 Marks]**

c. i. Write the general form of a C function definition. **[2 Marks]**

ii. Explain the main parts of a function **[2 Marks]**

d. Write a function named **biggest** that receives three integer arguments and returns the largest of the three values. Call this function from main( ) and print the biggest number. **[10 Marks]**